



STUDIES IN METHODS

Series F No. 26

**NATIONAL  
ACCOUNTING PRACTICES  
IN SEVENTY COUNTRIES**

**Volume I**

**UNITED NATIONS**

DEPARTMENT OF INTERNATIONAL ECONOMIC AND SOCIAL AFFAIRS  
STATISTICAL OFFICE

STUDIES IN METHODS

Series F No. 26

# **NATIONAL ACCOUNTING PRACTICES IN SEVENTY COUNTRIES**

**A supplement to the Yearbook of National Accounts Statistics**

**Volume I**



**UNITED NATIONS**  
**New York, 1979**

# **NOTE**

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## COMPOSITION OF THIS PUBLICATION

National Accounting Practices in Seventy Countries is published in three volumes, arranged as follows:

### Volume I

Introduction

Country papers:

Argentina	Colombia	France
Australia	Cyprus	Germany, Federal Republic of
Austria	Denmark	Ghana
Bolivia	Dominican Republic	Greece
Botswana	Egypt	Honduras
Brazil	El Salvador	Hong Kong
Canada	Ethiopia	India
Chile	Fiji	Indonesia

### Volume II

Country papers:

Iran	Lesotho	Netherlands
Iraq	Liberia	Nigeria
Ireland	Libyan Arab Jamahiriya	Norway
Israel	Malawi	Pakistan
Italy	Malaysia	Panama
Japan	Malta	Papua New Guinea
Jordan	Mauritius	Paraguay
Kenya	Mexico	Philippines

### Volume III

Country papers:

Portugal	Sri Lanka	United Republic of
Puerto Rico	Sudan	Tanzania
Republic of Korea	Sweden	United States of America
Saudi Arabia	Syrian Arab Republic	Uruguay
Sierra Leone	Thailand	Venezuela
Singapore	Uganda	Zaire
South Africa	United Kingdom of	Zambia
Southern Rhodesia	Great Britain and	
Spain	Northern Ireland	





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## INTRODUCTION

This survey of national accounting practices has been prepared by the Statistical Office of the United Nations as part of its continuing study of statistical methods. The survey is specially designed as a supplement to the United Nations Yearbook of National Accounts Statistics to provide the user of the Yearbook with helpful information on the way the country estimates have been compiled. The more general purpose of the publication is to promote the dissemination of information on country practices in the national accounting field with a view to their ultimate improvement through analysis and comparison.

A similar publication was issued in 1969, 1/ but much of the information contained in it is now 20 years old, indicating a great need for an updated edition describing national accounting practices at a fairly detailed level. The present publication has increased the coverage from 60 to 70 countries, and the amount of information included in each country chapter has been approximately doubled.

The approach adopted has been to proceed on a country-by-country basis, summarizing in independent sections for each country the principal features of its national accounting practices. The main emphasis is laid on the description of sources of primary data and methods of estimation. The discussion does not include any assessment by the Statistical Office of the adequacy of the methods employed or the reliability of the resulting figures other than those expressed by the countries themselves.

The 70 countries included in the survey are selected from countries which furnish the Statistical Office with extensive national accounts estimates, prepared according to the present or former United Nations System of National Accounts (SNA). The descriptions refer in general to national practices effective at the time of writing, i.e. 1977 and 1978. References to the main sources used in the presentation are given at the beginning of each country chapter; it should be noted that whenever the sources date back 10 years or more the bench-mark references have, in fact, been updated by supplementary information obtained directly from the national accounts agency.

### Scope of the chapters

Each country chapter is made up of two main parts: the introduction, which consists of separate sections for history, approaches used and main statistical sources; and a description of methods and sources of estimation, which contains separate sections on current-price estimates and constant-price estimates. The section on current-price estimates is further subdivided to cover gross domestic product by kind of economic activity, expenditure on the gross domestic product and cost structure of the gross domestic product, and the section on constant-price estimates refers to gross domestic product by kind of economic activity and expenditure on the gross domestic product.

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1/ National Accounting Practices in Sixty Countries, Studies in Methods, Series F, No. 11 C (United Nations publication, Sales No. 64.XVII.9).

The length of each country chapter and the balance between the parts and sections are largely a function of the scope of the estimates for the country published in the Yearbook of National Accounts Statistics and the extent of the information available on the country's methodology.

The introductory historical outline is intended to indicate the main events in the development of national accounting in the country, when the first efforts were made and when the most significant break-throughs were achieved, indicating also which authorities have been responsible at various times for publishing the data and the titles of some important publications.

The introductory sections describing the approaches used and the main statistical sources both contain information summarized from the subsequent sections on methods and sources of estimation at current prices. The main approach used to estimate the gross domestic product, the approaches used to estimate the value added of the different industries and the approaches used to estimate the different aggregates of final uses, are all important summary aspects of the methods of estimation adopted by the country. The section on main statistical sources contains a list of the most important statistical sources on which the production and expenditure estimates of the national accounts are based, including sources of bench-mark year estimates and current sources on annual estimates. This list is made up for each of the three tables; gross domestic product by kind of economic activity, cost structure of the gross domestic product and expenditure on the gross domestic product. The selection of the main sources is often made by the country itself, which means that the number of sources covered should not be taken as an indicator of the exhaustiveness of the countries' sources of data.

The next part of the chapter describes the sources and methods employed in preparing the current-price estimates of the gross domestic product tables by kind of economic activity, cost items and type of expenditure. Primary emphasis is given to the practices followed in compiling the principal national aggregates from the production side as the sum of value added of the various economic activities, from the income side as the sum of factor incomes generated in production and from the expenditure side as the sum of final expenditure on total product. Methods of estimating transfer items of income and outlay and capital finance flows are not generally discussed.

The sources and methods used to estimate the gross domestic product by kind of economic activity are described for each of the nine major divisions of the International Standard Industrial Classification of All Economic Activities (ISIC); information is given on the sources used, indicating how comprehensive the sources (or surveys) are, what kind of adjustments are necessary before they can be used, the methods of estimation used and the assumptions made in arriving at the actual estimates, often separately for bench-mark estimates and for current annual estimates. Any cross-checking against data from different sources is also indicated. In general, information is given in terms of gross output and in terms of intermediate consumption for as detailed a breakdown by industry as the source material permits. For some industries, information is included on the main products; for others, the different methods of estimation employed in the monetized and traditional sectors are outlined. Sector information is often available for the various components of value added when the income approach is used, but for some countries which make extensive use of the income approach, the description is not prepared by industry, since the estimation procedure and sources used show great similarities from industry to industry. Only a summary description is needed

in these cases, by factor income items instead of by kind of economic activity. For all countries, however, it is made clear which valuation concept is used in the preparation of the table of gross domestic product by kind of economic activity (producers' values, factor values etc.).

The section on expenditure on the gross domestic product contains a detailed description of sources and methods used to estimate the expenditure aggregates: government final consumption expenditure, private final consumption expenditure, increase in stocks, gross fixed capital formation, and exports and imports of goods and services. Usually, the presentation provides separate information on the different levels of government services, the broad groupings of consumer and capital formation items, and exports and imports by merchandise and other goods and services. The section on gross fixed capital formation is occasionally prepared by kind of economic activity instead of by type of capital goods. The use of the commodity-flow approach is often elaborated in detail, whereas the residual method used for private final consumption expenditure or increase in stocks for a number of countries is given only a brief mention.

The remaining section under current price estimates describes the sources and methods used to estimate the components of value added: compensation of employees, operating surplus, consumption of fixed capital and indirect taxes and subsidies. Countries emphasizing the use of the income approach usually give a detailed presentation of the practices they follow in estimating these items, in contrast to other countries, which mostly use the production approach and often arrive at the operating surplus (sometimes combined with other items) as a residual. The most comprehensive descriptions contain information by kind of economic activity and by subitems of compensation of employees (wages and salaries, social security contributions, etc.) and operating surplus (corporation profits, rents, interests, income in agriculture, income of professionals, etc.).

The final part of each country chapter consists of a relatively brief description of the methods used to derive the estimates at constant prices for the corresponding gross domestic product tables by kind of economic activity (the same nine major divisions of ISIC) and by type of expenditure, as described in the sections on estimates at current prices. Emphasis is placed on the basic method used, i.e., whether extrapolation or price deflation is used, or whether double deflation is applied in contrast to direct estimation of value added. The items specified in the corresponding tables at current prices are covered in this description, which rarely mentions data sources but often provides information on the specific indexes or indicators used.

#### General limitations

In a survey of this character, it is inevitable that the discussion should be less than adequate at many points. To a large extent this reflects the lack of pertinent information on the points at issue, and the Statistical Office hopes that countries will be encouraged by the appearance of the present volume to strengthen their published work in this area.

### Supplementary references

In the introductory part of each country chapter, specific references are made to the country's official publications on national income methodology; these sources may be consulted to amplify or clarify the material included in the present survey. Material published by international organizations includes a report prepared by the Statistical Office entitled "Country practices in national accounting at constant prices" (E/CN.3/464), dated 24 May 1974, and the revised annex thereto (ST/ESA/STAT.79) dated 23 May 1975, and books published by the Development Centre of the Organisation for Economic Co-operation and Development, including National Accounts in Developing Countries of Asia, published in 1972, and National Accounts and Development Planning in Low-Income Countries, published in 1974.

### Acknowledgement

The present survey has been prepared by the Statistical Office of the United Nations with the generous co-operation of the national statistical offices. These offices have provided both published and unpublished information on sources and methods, and they have commented in detail on early drafts of the respective country chapters. They were asked to correct, supplement, delete or update or otherwise comment on a draft narrative which was based on information available to the Statistical Office of the United Nations. Responsibility for any errors in the text of the final version rests solely with the Statistical Office.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers.

The Secretary-General wishes to express his appreciation to the national statistical offices and other governmental and private organizations for their co-operation in furnishing information for the preparation of this report.

## COUNTRY PAPERS

### ARGENTINA

The presentation that follows is mainly based on the comprehensive and detailed information in volume I of Sistema de Cuentas del Producto e Ingreso de la Argentina (Metodología y Fuentes), published by the Banco Central de la República Argentina in 1975. Other sources used are an article by J. V. Sourrouille, "The development of national accounts in Argentina", published in the Review of Income and Wealth in December 1976, and the United Nations report entitled "Country practices in national accounting at constant prices" (E/CN.3/464). Supplementary information was received from the Banco Central in May 1978.

#### Introduction

##### History

The first systematic estimates of the national accounts of Argentina were prepared during the Second World War by the Banco Central, which is the official agency primarily responsible for national accounting work, and comprehensive estimates appeared in 1946 in La Renta Nacional de la República Argentina.

In 1955 annual series on gross product and the use of goods and services began to be published in the Informe Anual and the monthly Boletín Estadístico of the Banco Central.

The Banco Central started preparing estimates on a quarterly basis in 1966, published in the Informes Económicos.

In 1971 it began to publish revised national account estimates based on the results of the 1963 censuses on industry, trade and services, estimates considered definitive for the period up to 1968.

In 1975 it presented a system of national accounts with estimates for the period 1950-1973, <sup>1/</sup> in accordance with the former SNA.

##### Approaches used

###### Gross domestic product

For the most part, the production approach is used to estimate the gross domestic product.

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<sup>1/</sup> Banco Central de la República Argentina, Sistema de Cuentas del Producto e Ingreso de la Argentina, vol. I, Metodología y Fuentes and vol. II, Cuadras Estadísticas (Buenos Aires, 1975).



### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries, since long statistical series on the economic activity of principal sectors and the economic censuses are in general production-oriented, whereas information on income is incomplete and lacks coherence.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, increase in stocks, and exports and imports of goods and services, and the current value of gross investment is estimated by the commodity-flow approach. Private final consumption expenditure is taken as a residual.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

#### Gross domestic product by kind of economic activity

Annual agricultural surveys

Monthly reports by the Ministry of Agriculture

Fisheries' statistics

Industrial census, 1963

Industrial surveys

Census of services, 1963

Financial statements of enterprises

Data derived from construction permits

Population censuses

Government accounts

Road transport passenger survey

Statistics on air transport

Statistics on water transport (rivers and ocean)

#### Cost structure of the gross domestic product

Population censuses

Government accounts

Basic data on contract salaries

Industrial census, 1963

Industrial surveys

Census of services, 1963

Financial statements of enterprises

Expenditure on the gross domestic product

Government accounts

Data derived from construction permits

Industrial surveys

Inventory statistics

Foreign trade statistics

Methods and sources of estimation

Current prices

Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

Agriculture, hunting, forestry and fishing

The figures that the Secretaría de Agricultura y Ganadería de la Nación compiles for the whole country serve as sources of information for obtaining basic statistics on agricultural production. These figures are valued at prices received by farmers, which are based on wholesale prices adjusted for estimated cost of transportation and commercial mark-ups.

Production statistics for agriculture and cattle-raising include the value of market sales of production, goods produced for farmers' own consumption, the value of own-account construction and improvements, the cost of seeds and seed production, and the value of sowing, harvesting, packaging, veterinary and similar services provided by contractors, etc. The crop years do not coincide with the calendar years; output is allocated to the calendar year in which the bulk of production is marketed. The information for principal crops is compared on an annual basis with statistics on total domestic consumption, exports, inventory fluctuations and estimated seed use.

Production estimates for beef, mutton and pork, representing 70 per cent of the total value of livestock production, is defined as the value of sales for slaughter, adjusted for changes in stocks and exports of live animals. Because of the importance of meat in the Argentine economy, there are numerous sources of statistical information for this subsector. The principal source for the slaughter of cattle is the Junta Nacional de Carnes, which controls production in packing

plants and slaughterhouses in the interior of the country. Figures on the slaughter of sheep and hogs suffer as a result of incomplete coverage, due in particular to the importance of own-account consumption. Production estimates of wool, milk and similar products are also incomplete and are not subject to periodic statistical control. Own-account consumption of meat is part of the production value estimated, but is based on uncertain sources.

No annual information is available on the value of intermediate consumption. Indirect indicators are therefore used, such as the production of commodities used mainly by the agricultural sector (fertilizers and animal husbandry products) and goods and services for which agricultural sales are registered as such (fuels, lubricants and insurance). This information is supplemented by estimates on the use of seeds and expenditure on the maintenance of equipment derived from ad hoc studies.

The value of hunting is estimated from information supplied by the Secretaría de Agricultura y Ganadería de la Nación and the Cámara Mercantil. With regard to forestry, the statistical sources are the industrial censuses and the Administración Nacional de Bosques, which provide data on the quantum extracted by species and the average value of each.

In the fishing estimates, both marine and inland fishing are included, on the basis of information on tonnage landed and average price by species obtained from the Dirección General de Pesca of the Secretaría de Agricultura y Ganadería de la Nación.

#### Mining and quarrying

For coal-mining, information on quantities is obtained from the Dirección Nacional de Energía y Combustibles and Yacimientos Carboníferos Fiscales. Average prices at the mine-head and sales values are obtained from the same sources. For other mining, quantities and average prices are supplied by the Dirección de Economía Minera, which maintains up-to-date statistics through direct consultation with producers.

With regard to crude petroleum and natural gas production, gross output is computed from data provided by Yacimientos Petrolíferos Fiscales and other companies. Data on the volume produced are available for each zone of operation, and regular statistics are issued. Products are valued as at the port of shipment, with prices obtained from the producers. Input data are supplied by state companies or obtained from the balance-sheets of a representative sample of mining enterprises.

#### Manufacturing

Industrial product series are generally estimated by interpolating prices and quantities between census years. The latest industrial census of 1963 includes all industrial establishments, and the statistics appear to be reasonably reliable. Certain adjustments are made to the census figures, however, for estimations of small-scale artisan production not included in the censuses, for valuation of the output of vertically integrated firms such as petroleum companies, and for the tax treatment of certain producers. Census data on certain inputs are also adjusted to include estimates of administrative costs obtained from enterprise balance-sheets.

In the intercensal interpolations it is assumed that the ratio of physical intermediate consumption to output remains constant at a somewhat disaggregated level, although year-to-year changes on relative prices between inputs and outputs are taken into account. Since 1963 extrapolations have been based on changes in the production volume obtained from surveys of various organizations. Information on prices is obtained from the wholesale price index and miscellaneous sources for products not included in that index.

### Electricity, gas and water

The estimation of electricity production is based on information provided by financial statements of a sample of enterprises, from which global estimates are derived. Gas production data are obtained from the public enterprise Gas del Estado, and, in the case of bottled gas, on the basis of a sample of enterprises.

For water supply the financial statements of Obras Sanitarias de la Nación provide all the relevant information.

### Construction

Different methods are used to estimate the value of production in the private and public sectors. In the former case the volume of production is based on the number of construction permits issued. The coverage is incomplete, however, since not all construction authorized is actually carried out, and the period of construction differs for different kinds of buildings. These estimates are converted into value figures by using the cost of construction index, built upon data gathered in the beginning of the 1950s.

Intermediate consumption of private activities is estimated from an analysis of budgets for various types of construction work, regular surveys of construction enterprises, and information from the Cámara Argentina de la Construcción. The data are weighted according to regional differences.

The basic data for public construction are obtained from accounting data provided by the various official organizations and state enterprises. Intermediate consumption is estimated on the basis of coefficients obtained from a study of records in the field of public works.

### Wholesale and retail trade, restaurants and hotels

The method used to estimate the gross output of the trade sector is to apply gross percentage mark-up rates to the value of the goods recorded as entering the various marketing channels (the total production or import values of products). The total flow of goods is classified under the following categories: agricultural intermediaries, livestock intermediaries, wool, poultry, egg and milk intermediaries, marketing of mining products, marketing of industrial goods, and marketing of imports and exports. The mark-ups are determined from direct surveys, marketing boards or other sources. The value of input is calculated separately for each of the above groups, making use of information from the balance-sheets of joint-stock companies and other inquiries.

The gross output of restaurants and hotels is calculated on the basis of the services censuses (the latest was in 1963), extrapolated by using the income

statistics prepared by the Instituto Nacional de Estadística y Censos and special surveys conducted by the Banco Central. The input ratios used are based on the censuses and updated from the mark-up surveys.

#### Transport, storage and communication

For railways the information needed for the computation is taken from the accounts of Ferrocarriles Argentinos. Information on tariffs, traffic volume and the number of commercial vehicles in circulation, adjusted by estimates of average annual mileage per vehicle, serves as basis for the estimates of private freight transportation services. Buenos Aires underground railway activity is estimated from annual reports, and the Secretaría de Transportes collects financial statements from all enterprises providing bus services in the capital and interprovincial service with minibuses. The remaining bus services are estimated from the above estimates, special annual surveys and the total number of registered vehicles in the country. Extensive information on taxi-cabs is provided by the municipality of Buenos Aires and the associations of taxi-cab owners. Supporting services to land transport are estimated from the service censuses, and extrapolated by information on the number of establishments, garages and parking lots, and average incomes.

Water transport is estimated from the financial statements of public enterprises and surveys of private enterprises, carried out by the Banco Central and the Instituto Nacional de Estadística y Censos. Air transport is also estimated from financial statements of the enterprises, but certain services allied to air transport (helicopters, flying ambulances, etc.) are not covered in the estimates. Otherwise, services allied to transport are estimated from services censuses data, etc.

For communication, the enterprises provide all the data needed to estimate the components of their production accounts, using their profit-and-loss accounts and additional information.

#### Financing, insurance, real estate and business services

For financial intermediaries, the data used in calculating product and income, including the imputed service charges, are based on the financial statements of all credit institutions throughout the country. The Superintendencia de Seguros de la Nación supervises all insurance companies operating in the country, and receives and compiles all their financial statements, thus providing the data needed to calculate the value added of insurance services.

On the basis of the population censuses, which give the number of rented dwellings by district and rent-scale, the value of rents paid per year is calculated, and new dwellings built for renting are incorporated. Deductions are made for buildings that have reached the end of their useful life. Rent costs have been adjusted over the years in accordance with the rent component of the consumer price index, and other adjustments resulting from housing legislation. In the case of owner-occupied dwellings, the average gross rent for rented dwellings is used.

Business services are included in community, social and personal services.

## Community, social and personal services

The general account of the Treasury forms the basis from which the estimates of value added of producers of government services are made, supplemented by data on the Fondo Nacional de la Energía, special taxes, incomes and expenses of the social security system, etc. For provincial governments, the analytical data of the Consejo Federal de Inversiones furnish all the data needed to estimate the current accounts. For local governments the estimates are based on accounting information for Buenos Aires and the other municipalities of that province, and for a sample of the remaining municipalities. From 1969 onwards the Dirección Nacional de Programación e Investigación has also provided the budgets of all the municipalities in the country.

Estimates for other private services are made for five main groups. For business services and other professional services, the estimates are based on the population censuses; these provide the number of professionals, which is extrapolated on the basis of the number of graduates and adjusted to allow for deaths. Estimates of average annual income by speciality are extracted from data of the former Caja de Profesionales and intermediate consumption is estimated as a rough approximation. The gross output of domestic services is calculated as the sum of wages and salaries paid and employers' pension contributions; the former are calculated by multiplying the number of employees by an average annual compensation estimated on the basis of the wages offered in newspaper advertisements. The estimates for radio and television services are calculated on the basis of a survey carried out by the Banco Central. These services provided by private educational institutions are estimated on the basis of the number of teaching and administrative staff, provided by the Dirección de Estadística Educativa of the Secretaría de Cultura y Educación, and supplemented by income and expenditure statistics obtained by the Banco Central.

Data for the remaining activities are obtained from the service censuses, supplemented by the survey carried out by the Instituto Nacional de Estadística y Censos, the surveys of the Banco Central and the former Caja Nacional de Previsión, which engaged in commercial and civil activities. The calculations are made by multiplying the number of workers by an average remuneration in order to obtain the total amount of wages and salaries paid.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Government final consumption expenditure consists of compensation of employees and net purchases of goods and services. The basic information is obtained from the government accounts for each of the government jurisdictions (the nation, provinces and municipalities).

### Private final consumption expenditure

Private final consumption expenditure is estimated as a residual by deducting from the gross domestic product at market prices government final consumption expenditure, gross domestic fixed investment, changes in stocks and the balance of current external transactions. Considering that increase in stocks is calculated on the basis of a representative sample of principal local productions, the

estimates of private consumption expenditure obtained by this procedure constitute a relatively acceptable approximation for a statistical series over several years, even though they include part of the increase in stocks.

#### Increase in stocks

This aggregate includes changes in agricultural, mining and manufactured goods. The value of each commodity to be included is estimated by multiplying the quantities resulting from a comparison of inventories at the beginning and end of each period by the average prices prevailing during the period in question. In the case of some products, the period does not coincide with the calendar year, and stocks are therefore calculated on the basis of the business year. Data are obtained from statistical surveys conducted by official bodies and from other private sources.

#### Gross fixed capital formation

Three basic sources of information have been used to estimate investment in construction. For the public sector, accounting data from government and public enterprises are used; agricultural construction and improvements are estimated from agricultural census data and are interpolated on the basis of rough estimates of the flow of goods and materials used principally for agricultural purposes; urban private construction is estimated from construction licences and miscellaneous sources, the principal limitations arising from the incomplete coverage of the basic information and the general use of the cost of construction index as an indicator of changes in the value of all the different kinds of construction.

The commodity-flow approach is used to estimate gross investment of transport equipment, machinery and other equipment. Domestically produced capital goods are computed on the basis of the industrial censuses by using a selection of capital goods at ex-works sales prices, to which is added the value of the marketing process in order to arrive at purchasers' prices. Starting from the latest census data, the information is updated by a combination of indexes of physical output and price indexes. Much of the data used is collected by the Instituto Nacional de Estadística y Censos, the Consejo Nacional de Desarrollo and surveys conducted by the Banco Central. Imports and exports of capital goods are calculated from foreign trade statistics. Data used for the adjustment to values paid by the final users are obtained from official publications, special tabulations and questionnaires sent to enterprises, users and importers. Adjustments are made for customs duties, importers' commissions, port charges, foreign exchange costs and marketing schedules and mark-ups, including transportation and other costs.

#### Exports and imports of goods and services

The balance-of-payments accounts are calculated by the Banco Central from customs data provided by the Instituto Nacional de Estadística y Censos, and from information supplied by banks and other institutions authorized to operate in the exchange market. Good information is available on operations carried out directly by the public sector, whereas private transactions, in general, are estimated from incomplete records of the purchase and sale of foreign exchange.

## Cost structure of the gross domestic product

### Compensation of employees

The procedure used is, in general, based on employment data and average and total remuneration obtained from the economic and population censuses, and information about collective wage agreement data. The estimates are probably less reliable for agriculture, construction and domestic services than for the other sectors, because no information on average remuneration is available from the censuses for these activities. The basic data on employment by kind of economic activity are, in general, satisfactory for census years. Intercensal estimates, on the other hand, are very rough indeed, except for those activities for which accounting data are available. The 1970 population census is the new bench-mark for these figures.

### Operating surplus

This item is, in general, obtained as a residual by deducting compensation of employees from value added in factor values for each of the economic sectors. Depreciation estimates are deducted independently (see below).

### Consumption of fixed capital

The consumption of fixed capital is valued at original cost. Unforeseen obsolescence is treated as a capital loss and consequently not included in the capital consumption estimates. The consumption of fixed capital is calculated on the basis of accounting data from public enterprises, capital stock data in the case of private construction, gross investment data and estimated depreciation rates in the case of durable production equipment.

### Indirect taxes and subsidies

The sources of information for indirect taxes are given by type of government authority. For the purpose of determining the economic impact of these taxes on producers' costs, the different levies are classified as national, provincial or municipal according to the jurisdiction of the taxation authority, and then according to the economic activity upon which they fall. Tax collection figures are obtained from the Contaduría General de la Nación and the Dirección General Impositiva at the national level, and from the Consejo Federal de Inversiones and the Dirección Nacional de Programación Presupuestaria at the provincial and local levels.

For subsidies the figures are calculated by enterprise on the basis of an examination of the production account of each enterprise. The figures for direct payments of subsidies to private enterprises to cover their current deficits are obtained from an analysis of the annual general government account.



## Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

Value added of agriculture, forestry and fishing in 1960 is extrapolated by a quantity index for output, based on indicators for more than 200 individual products.

#### Mining and quarrying

Value added is extrapolated by a quantity index for output, based on indicators for 80 individual products.

#### Manufacturing

Value added is extrapolated by indexes of production volume based on direct and indirect indicators.

#### Electricity, gas and water

Value added is extrapolated by indexes of production quantities.

#### Construction

For private construction, value added is extrapolated by volume indexes of inputs; for other construction, the current values are deflated by an index of cost of construction.

#### Wholesale and retail trade, restaurants and hotels

The value added of the trade sector is extrapolated by indexes of marketed agricultural production, industrial production and external trade. For restaurants and hotels, indicators based on the number of persons employed are used for extrapolation.

#### Transport, storage and communication

In most cases value added is extrapolated by indicators of quantity carried and services rendered. For taxi-cabs the indicators used are obtained by deflating current income by index of producer prices or rates.

#### Financing, insurance, real estate and business services

Value added is extrapolated by the number of employees for banking, extrapolated by a quantity index of services rendered in the case of insurance. Value added of ownership of dwellings is extrapolated by a quantity index of output.

#### Community, social and personal services

No single typical approach is used for all components; in some cases value added is extrapolated by quantity indexes for the production of services (cinemas,

personal services, etc.); for others, value added is extrapolated by employment data (broadcasting, independent professions). For producers of government services, value added is extrapolated by the number of persons employed.

#### Expenditure on the gross domestic product

##### Government, final consumption expenditure

Wages and salaries are extrapolated by the number of persons employed for the various levels of government. Purchases of goods and services are deflated by the wholesale price index for non-agricultural goods.

##### Private final consumption expenditure

Private consumption expenditure at constant prices is obtained as a residual.

##### Increase in stocks

Stocks of products in agriculture, manufacturing and some other industries are extrapolated by means of indexes of quantity changes.

##### Gross fixed capital formation

No single typical approach is used for all components. For public construction, the current values are deflated by indexes of construction costs; for private construction they are deflated by indexes of construction costs or extrapolated by volume of inputs; for domestic machinery and equipment products they are deflated by index of producer prices or extrapolated by volume of production; and for imported machinery and equipment they are deflated by appropriate world prices.

##### Exports and imports of goods and services

Price deflation is used, for merchandise deflated by an index based on world trade prices in United States dollars and for fares and travel abroad deflated by prices indexes of wholesale and retail trade of foreign countries.

#### AUSTRALIA

The presentation that follows is mainly based on information contained in recent issues of the series Australian National Accounts, especially Gross Product by Industry at Current and Constant Prices 1962-63 to 1973-74, published by the Australian Bureau of Statistics in November 1975, and National Income and Expenditure 1974-75, published by the Bureau in May 1976. Further detailed information was received from the Bureau in February 1978.

## Introduction

### History

Official estimates of national income and expenditure were first compiled in 1945 by the Commonwealth Bureau of Census and Statistics for the years 1938/39 to 1944/45, and since then have been published annually in a series of papers entitled National Income and Expenditure, which accompany the Commonwealth Government Budget.

Quarterly estimates of national income and expenditure were first published in December 1960, consistent with the annual figures published with the Commonwealth Government Budget in August 1960. Bulletins entitled Quarterly Estimates of National Income and Expenditure have been published for each subsequent quarter.

In 1963 a number of important changes in the structure and presentation of the national accounts and in the conceptual basis and definitions of the principal aggregates were introduced by the Australian Bureau of Statistics in Australian National Accounts, National Income and Expenditure, 1948-49 to 1961-62, the first publication to present constant-price estimates of the principal expenditure aggregates. Successive issues of this annual publication provide the main national accounting reference.

Experimental input-output tables were first prepared for 1958/59 and published in 1964. They were followed by tables for 1962/63, published in 1973. The third publication in the series 1/ was issued in 1977.

Estimates of industry gross product at constant prices, and industry estimates at current prices consistent with them, were presented in the bulletin Estimates of Gross Product by Industry at Current and Constant Prices, 1959-60 to 1965-66. 2/ This bulletin was updated in 1975 and 1977.

Quarterly series at constant prices were first published in a supplement to the quarterly bulletin published in December 1970.

In Australian National Accounts, National Income and Expenditure, 1971-72, published by the Bureau in 1973, the structure of the accounts was revised to accord more closely with the international standard described in the United Nations System of National Accounts. 3/

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1/ Australian National Accounts, Input-Output Tables 1968-69 (Canberra, Australian Bureau of Statistics, 1977).

2/ Published as a supplement to Australian National Accounts, National Income and Expenditure, 1953-54 to 1966-67 (Canberra, Australian Bureau of Statistics, 1969).

3/ A System of National Accounts, Studies in Methods, Series F, No. 2/Rev.3 and corrigendum (United Nations publication, Sales No. E.69.XVII.3).

## Approaches used

### Gross domestic product

As a rule the income approach is used to estimate the gross domestic product, but the expenditure approach may well be equally important, as the statistical discrepancy resulting from these two approaches is, by convention, recorded on the expenditure side only.

### Gross domestic product by kind of economic activity

Gross domestic product by kind of economic activity can be estimated using both the income and the production approach. For agriculture (including services to agriculture), mining, manufacturing and ownership of dwellings, estimates are compiled using the production approach. For many industries data sources do not permit a production-based estimate of gross product; thus the production approach is only used directly for agriculture and ownership of dwellings and the income approach is used for all other sectors.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, exports and imports of goods and services and increase in stocks. A combination of the expenditure approach and the commodity-flow approach is applied for private final consumption expenditure and gross fixed capital formation.

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

See under "Cost structure of the gross domestic product"

### Cost structure of the gross domestic product

Monthly pay-roll tax returns

Government employment and wage data

Insurance and superannuation data

Income-tax tabulations

Government accounts, budget papers, published annual reports

Periodic surveys of interest, rent, royalties and dividends

Quarterly surveys of non-financial corporate profits

Annual census of rural holdings

Rental data and data on the number of dwellings obtained from censuses of population and housing

Statistical collection of data from financial institutions

Statutory returns by banks and life insurance offices

Expenditure on the gross domestic product

Government budgets and accounts

Quarterly surveys of retail establishments

Censuses of retail establishments

Quarterly surveys of stocks

Income-tax tabulations

Rental data and data on the number of dwellings obtained from censuses of population and housing

Revenue data from public enterprises, universities, public hospitals etc.

Quarterly statistics of building activity

Quarterly surveys of new capital expenditure by private businesses

Export and import statistics

Methods and sources of estimation

Current prices

Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values by summing the industry details of the components of the cost-structure of the gross domestic product: wages, salaries and supplements, net operating surplus and depreciation allowances.

The income components are estimated from different sources, which use different units of classification. For gross product by industry, estimates are required on an establishment basis. Therefore, where the source data are classified by industry-or-enterprise units the data have been adjusted, as far as

possible, to an establishment basis. The industry classification of the estimates is based on the Australian Standard Industrial Classification (ASIC).

Current-price data on the value of output and intermediate input of establishments classified under each industry are required to estimate gross domestic product at constant prices by kind of economic activity. However, data sources do not permit the estimation of output and input for most industries.

The methods used to estimate the value of output and intermediate input for each industry at current prices are outlined below.

#### Agriculture, hunting, forestry and fishing

Gross product for agriculture and services to agriculture equals the estimated gross value of production (after stock valuation adjustment) less estimated production costs other than wages and depreciation.

Gross value of farm production is the total value of goods and services produced by the rural sector. Estimates are derived largely from an annual census of all rural holdings of one hectare or more in extent. Additional information is obtained from various authorities such as the Australian Wheat, Egg, Meat and Dairy Produce Boards etc., and wool-selling brokers and dealers.

Costs of production, such as seed, fertilizers, fuel, maintenance and insurance, are estimated on a per-unit-of-production basis, derived from results of surveys conducted by the Australian Bureau of Statistics and the Bureau of Agricultural Economics. Other costs, such as manufactured fodder and marketing costs, are estimated directly.

The value of production of forestry, fishing and hunting is derived from data supplied by various authorities.

#### Mining and quarrying

Estimates of output and input are based on data from annual mining censuses. Since 1968/69, a census of mining establishments has been conducted annually, on an integrated-economic-census basis.

The value of output is derived as the sum of sales and transfers-out of minerals and other goods, all other operating revenue and capital work done for own use or for rental or lease, the change in stocks of finished goods and work-in-progress and the gross product of uranium establishments. The value of input is derived as the sum of purchases and transfers-in of materials, fuels etc., selected expenses, change in stocks of materials, fuels etc. and the output of services to mining. Estimates of output and input of services to mining are based on data from annual censuses of mineral exploration.

#### Manufacturing

Since 1968/69 the annual census of manufacturing establishments has been conducted on an integrated-economic-census basis, and gross product has been derived as the difference between the value of output and the value of input. For the years prior to 1968/69 value of output only was estimated. Estimates of both output and input are based on data from the annual censuses. Data from the

censuses conducted before 1968/69 have been adjusted as far as possible to an integrated-economic-census basis, but earlier factory censuses differed both in data concepts and reporting units from the censuses conducted from 1968/69 onwards.

### Electricity, gas and water

For electricity generation and distribution and gas production and distribution, estimates of output are obtained from the Census of Electricity and Gas Establishments for 1968/69, 1969/70 and 1971/72. For the remaining years, estimates are derived by interpolation and extrapolation of census data by the revenue of electricity and gas undertakings. Input is mostly derived by using input-output relationships based on census data.

For water, sewerage and drainage, output is estimated as the sum of the revenue of government water supply and sewerage undertakings and government current expenditure on irrigation.

### Construction

Gross output is estimated as the sum of gross fixed capital expenditure on dwellings and other buildings and construction, maintenance for dwellings and other buildings and construction, and wages paid by public enterprises for the installation of telecommunication and other equipment. Estimates of intermediate input are obtained by deducting from the estimate of gross output the estimate of income-based gross product.

### Wholesale and retail trade, restaurants and hotels

The output of the wholesale trade sector consists of the value of wholesale sales. Direct estimates of wholesale sales in 1968/69 were obtained for 62 commodity groups from the 1968/69 census of wholesale establishments. For other years estimates are obtained by extrapolating the 1968/69 estimates by data on production, imports and exports. Estimates of gross margins for 1968/69 have been obtained for each commodity group, using 1968/69 census data.

The output of the retail trade sector consists of the value of retail sales. Direct estimates of retail sales in 1968/69 were obtained for 44 commodity groups from the 1968/69 census of retail establishments. Estimates for other years are derived from sample surveys of retail establishments.

Restaurants and hotels are included among community, social and personal services.

### Transport, storage and communication

For railway transport, output is estimated from revenue data supplied by the transport authorities. The value of output for bus and tramway transport and other road passenger transport is estimated as the sum of the appropriate components of private final consumption expenditure on transport and estimated expenditure on taxi-cabs by businesses. The value of output is not calculated for freight transport by road and services to road transport. Neither is it calculated for ocean, coastal and inland water transport. The value of output for stevedoring services is estimated from balance-of-payments data on such expenditure by overseas

vessels in Australian ports. The output of services to water transport not elsewhere classified is estimated from public finance data and revenue data of the major port authorities.

Operating revenue data from the annual reports of the major Australian airline companies, classified according to the service provided, are used to derive the output estimate for air transport.

The value of output for domestic telecommunication services is estimated from revenue data supplied by the Australian Telecommunications Commission. The value of output for postal services and overseas telecommunication services is not estimated.

#### Financing, insurance, real estate and business services

The output of financial enterprises consists of charges made, i.e. imputed charges and direct charges levied, plus gross rent received. Gross output is estimated mainly from statistical collections carried out by the Australian Bureau of Statistics, copies of statutory returns by banks and life insurance offices and data from the Reserve Bank. For other industries in the finance group, output is indirectly estimated from the estimate of income-based gross product. The imputed bank service charge is estimated from data on interest receipts and payments by banks and similar financial institutions.

For ownership of dwellings, bench-marks for gross rent are based on rental data and the number of dwellings ascertained from the quinquennial censuses of population and housing. The imputed rent for owner-occupied dwellings is based on average rents for tenanted dwellings for various categories of dwellings (by state) and the corresponding number of owner-occupied dwellings. Intercensus movements are based on rental data used in constructing the consumer price index and the number of dwellings completed from collections of building activity. Operating expenses include municipal rates, insurance, maintenance and commissions, based on various surveys and indicators.

For real-estate services, output is calculated from the results of a survey of estate agents and from employment data. The output of business services is estimated for income-tax tabulations.

#### Community, social and personal services

The gross product of public administration is derived as wages, salaries and supplements paid to Commonwealth, State and local government administration employees, plus indirect taxes. For defence, the gross product is derived as wages, salaries and supplements paid to members of the defence forces.

Output for community services is derived from estimates of private and government final consumption expenditure on health, welfare, education and other community services. The output of dentists, doctors, optometrists, physiotherapists, other medical practitioners, veterinary services and non-profit organizations is assumed to equal private final consumption expenditure on these services. The output of public health, police and correctional services, fire and road services, cultural and recreational services and welfare is derived as government final consumption expenditure on these services. The output of



hospitals, lending libraries and public and private education is estimated as the private and government final consumption expenditure on these services.

The value of output of entertainment, recreation, restaurants, hotels and personal services is assumed to equal expenditure on the services provided by establishments classified under the industry, plus the value of sales of alcoholic drinks and cigarettes and tobacco by hotels, clubs, etc. Expenditure on entertainment, coaching, domestic services, hairdressing and dry-cleaning services, hiring charges, funeral expenses and meals and accommodation in motels, hotels, cafés, clubs and boarding houses is obtained mainly from estimates of private final consumption expenditure on these services. Expenditure on recreational facilities is estimated from government final consumption expenditure data. The value of sales of alcoholic drinks and cigarettes and tobacco by hotels, clubs, etc. is obtained by extrapolating the 1968/69 value of such sales, based on data from the 1968/69 census of retail establishments, by estimates of total private final consumption expenditure on these items.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

For government final consumption expenditure, information is collected on an annual and quarterly basis for the three levels of government. The annual information from Commonwealth and State budget papers (including attached documents) is supplemented by details from departmental annual reports and special requests for information. Information on public corporations is available in their published annual reports and reports of the government auditors. The published accounts of individual local government bodies are also analysed.

The transactions as recorded in the conventional accounting systems of the organizations which make up the government sector have to be analysed and reclassified into the national accounting format. Since this is not completed until late in the following financial year, provisional estimates have to be made for the last completed financial year. This is done by using the quarterly estimates and preliminary data provided by government departments and public corporations.

#### Private final consumption expenditure

Annual estimates of expenditure on goods are generally derived from two main sources: (a) the results from retail censuses (1961/62, 1968/69 and 1973/74) and quarterly surveys of retail sales; and (b) the commodity-flow method, using production, import and export data.

Estimates of expenditure on food, alcoholic drinks, footwear, clothing and drapery, electrical goods, furniture, floor-coverings, newspapers, books, etc., toys, sporting and travel goods are based mainly on the results from censuses of retail establishments. For years when censuses are not conducted, annual estimates are extrapolated mainly on the results of quarterly surveys of retail sales.

For expenditure on cigarettes and tobacco, hardware and other durables and some other goods, estimates are based on production, import and export data. If such data are not yet available, excise data and retail sales survey results are used.

Purchases of new motor vehicles are based on motor vehicle registration records and price data.

Estimates of expenditure on gas and electricity are based on data on domestic use from the supply organizations. The estimate of expenditure on other fuels is based mainly on related production and price data.

Estimates of expenditure on services are mainly based on revenue or earnings data. Expenditure on health is estimated from income tax tabulations, government reports on public hospitals and nursing homes and retail sales results for expenditure on medicines etc. Dwelling rent is estimated using a perpetual-inventory model of the stock of dwellings and the rent component of the consumer price index. Expenditure on rail, tram and bus fares is mainly based on reports of government transport authorities. Expenditure on other fares is based on passenger revenue for domestic fares, a balance-of-payments survey for air fares etc. Expenditure on postal and telephone services is estimated from data supplied by the Australian Postal and Telecommunications Commissions.

Expenditure on the operation of motor vehicles is built up from a variety of sources, including motor vehicle usage surveys, periodical surveys by motoring associations etc.

Expenditure on education services is estimated from data on university receipts, government school fees received and other sources, and expenditure on entertainment and recreational services is derived from a wide range of data; expenditure on other miscellaneous services is also estimated from a variety of sources.

Net expenditure overseas is estimated as Australian tourist expenditure overseas, based on Reserve Bank data, and Australian diplomatic and defence force expenditure overseas, based on wage data, less overseas tourist and diplomatic expenditure in Australia, based on balance-of-payments data and wage data.

#### Increase in stocks

Annual estimates of the increase in the book values of non-farm stocks are based on the annual censuses of manufacturing establishments, the periodic censuses of retail establishments, the 1968/69 census of wholesale establishments and, for other industries, mainly on the opening and closing stocks obtained from income-tax tabulations. For the most recent years when economic census results and income-tax tabulations are not yet available, and for years in which particular economic censuses are not conducted, annual estimates are obtained by extrapolating from the latest annual bench-marks, using the results of the quarterly business surveys of stocks.

For farm stocks the change in the book value of stocks (mainly wool and harvested crops) is estimated from production and usage data. Estimates are made for the increase in public authority stocks, including stocks of the Australian Wool Corporation.

The increase in stocks is estimated as the change in the book value of stocks, adjusted by that part attributable to changes in the prices at which stocks are valued (referred to as the stock valuation adjustment).

## Gross fixed capital formation

Estimates of public gross fixed capital expenditure are made on the basis of information in Commonwealth and State budget papers, supplemented by details from departmental reports, published accounts of local government bodies and annual reports of public corporations.

The main source for private gross fixed capital expenditure on dwellings is the quarterly new building collection of the Australian Bureau of Statistics, which provides estimates of the value of work done on dwellings by the private and public sectors. Details are obtained from building contractors, public authorities with day labour teams and owner-builders on the number and value (on completion) of houses and flats commenced and completed each quarter and under construction at the end of each quarter. In addition, the estimated value of work done on each dwelling at the end of each quarter is obtained from all informers except owner-builders. Separate estimates are made for the construction of dwellings not included in the collection (such as some farmhouses) and work done on alterations and additions of less than \$10,000, and for architects' fees.

Estimated expenditure by public authorities is deducted to give the private component. Annual estimates are aggregations of the quarterly estimates.

For other building and construction, the main source is the quarterly survey of new capital expenditure by private businesses, which measures expenditure on new buildings and structures.

For all other private gross fixed capital expenditure on an annual basis, the main source is statistics of depreciable assets shown on income-tax returns. Allowance is made for the special taxation provisions applying to the mining and rural industries. An estimate is also made for late returns by companies. Estimates for the latest two years are subject to considerable revision when income-tax tabulations become available.

Because of the two-year lag in income-tax tabulations, use is made of the quarterly business surveys for extrapolation and quarterly dissections. For rural industries other indicators are used, e.g. the tractor sales collection.

## Exports and imports of goods and services

Exports and imports of goods are recorded by the Bureau of Customs and information is available monthly. These recorded merchandise trade figures are adjusted as far as practicable to exclude transactions in which no change of ownership has occurred and to include certain transactions in which ownership has changed but customs entries have not been made. Adjustments made to put wool exports on to a correct change-of-ownership timing basis, and adjustments made to record imports of large items of equipment at the time of change of ownership instead of the time of delivery, can be significant in quarterly estimates.

The principal adjustment made is a "valuation adjustment" representing the excess of the recorded value of imports (based on value for duty) over the estimated selling price to the importer, as shown on invoices accompanying customs entries. Since July 1976, import data have been available on both the free on board (f.o.b.) transaction-value basis (as required for national accounts purposes) and the value-for-duty basis (as published in the recorded trade figures).

Receipts and payments from transportation services are estimated from quarterly survey results. For travel and miscellaneous services, receipts and payments are estimated mainly from the Reserve Bank's foreign exchange ticket system (available monthly). Receipts and payments arising from government transactions are estimated from Treasury sources.

### Cost structure of the gross domestic product

#### Compensation of employees

The estimates of wages and salaries are based mainly on monthly pay-roll tax returns and government returns. For private businesses not subject to pay-roll tax, wages and salaries are estimated by using average earnings data from pay-roll tax tabulations and estimates of employment. Employment bench-mark data are derived from the periodic censuses of population and from other sources and are interpolated between and extrapolated from censuses mainly on the basis of pay-roll tax data.

Supplements to wages are calculated annually by using insurance and superannuation data. Estimates for the latest year are calculated by using indicators of expected growth in insurance and superannuation businesses, as well as the trend in the level of wages and salaries.

#### Operating surplus

For companies, this item consists of company income, net interest, land rent and royalty payments, third-party insurance transfers, less stock valuation adjustment. Annual company income estimates are based on income tax tabulations. The time-lag in processing income-tax statistics is about two years. Estimates for the latest year are based on indicators from a quarterly survey of profits conducted by the Australian Bureau of Statistics and a survey of income movements conducted by the Taxation Commissioner. For the second last year, estimates are based mainly on preliminary tabulations of matched taxation assessments.

Annual estimates of net interest, land rent and royalty payments are based on an analysis of data from surveys held in 1958/59, 1963/64 and 1967/68, from annual returns for financial institutions showing details of receipts and payments of property income, and from public finance statistics.

A stock valuation adjustment is calculated on a quarterly basis as the difference between movements in the book value of stocks in the period and the value of physical change in stocks (closing stocks less opening stocks, both revalued at average prices for the period).

For unincorporated enterprises, non-farm income is based on taxation tabulations, the main body of which becomes available after two years. Tabulations of taxable-income movements provide the main basis for preliminary estimates in the second last year, while indicators of changes in levels of activity by industry are the basis of estimates for the latest year.

The gross operating surplus of unincorporated farm enterprises is calculated as the gross value of farm production less production costs (including wage costs). Taxation data are used to derive the company share and this is deducted from the total to give the gross operating surplus of unincorporated far enterprises.

For dwellings owned by persons, the gross operating surplus is derived as gross rent less operating expenses. Estimates for dwellings owned by companies and public enterprises are made using bench-mark data from periodic surveys of interest, rent and royalties and public authority statistics.

Estimates of the gross operating surplus for public trading enterprises are based on revenue and operating expenses (intermediate consumption and wage costs) or public enterprises. The information is mainly obtained from annual reports of the enterprises and from Auditor-General's reports.

The main sources for estimating the net operating surplus of financial enterprises are the statistical collections carried out by the Australian Bureau of Statistics, copies of statutory returns by banks and life insurance offices and data from the Reserve Bank. The same sources are used for the imputed bank service charge.

#### Consumption of fixed capital

The information on depreciation allowances is also based on income tax tabulations and sources used in estimating the operating surplus (see above).

#### Indirect taxes and subsidies

Indirect taxes are collected by the Commonwealth, State and local governments, whereas subsidies are paid by the Commonwealth and State governments.

The sources of data for indirect taxes and subsidies include Commonwealth and State budget papers and annual reports of taxation authorities.

### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Double deflation is used for agriculture; output estimates are obtained for most commodities by revaluing quantities produced at base-year prices; input commodities are also revalued at base-year prices (maintenance costs, fuel costs etc. revalued by relevant price indexes). For forestry, fishing and hunting, total base-year gross product is extrapolated by a quantum index of output. Quantity revaluation is mostly used in the derivation of this quantum index of output.

##### Mining and quarrying

Double deflation is used; current-price output is revalued by quantity, revaluing the major minerals produced. Current-price input is revalued by relevant available price indexes.

##### Manufacturing

The gross output method is used, whereby a quantum index of the components of output is used to extrapolate base-year gross product of each class of industry. The deflator for the largest component of output, sales and transfers out is derived

mostly by the use of indexes of manufacturers' prices. The increase in stocks of finished goods and work-in-progress is obtained by revaluing the current-price values of opening and closing stocks by indexes of manufacturers' selling prices; the estimate of increase in stocks at constant prices is the difference between these revalued stocks. Other operating revenue is mostly revalued by price indexes appropriate to the major source of revenue. Capital work done is revalued by a fixed weighted index of wage-rates and prices of materials used.

#### Electricity, gas and water

Quantum indexes of output are used to extrapolate each of the base-year gross products of electricity production and distribution and water distribution. These indexes are derived mostly by quantity revaluation. Double deflation is used for gas production and distribution whereby separate constant-price estimates of output and intermediate input are derived. Quantity revaluation is used to obtain the output estimates. A deflator consisting of appropriate price indexes is used to revalue the current-price estimates of intermediate input.

#### Construction

Gross product is extrapolated by a quantum index of intermediate input, obtained by revaluing the current-price estimate by a base-weighted index of the price of materials.

#### Wholesale and retail trade, restaurants and hotels

Value added of each of these trade sectors in the base-year is extrapolated by net-margin-weighted indexes of constant-price commodity group sales. The current-price estimates of commodity group sales are deflated by appropriate base-year weighted price indexes.

The current-price estimates of accommodation (excluding food) in motels, hotels etc. are revalued by indexes of tariff rates. Constant-price estimates of meals in motels, hotels, etc., are obtained by extrapolating base-year value of output by a separately estimated quantum index of food input.

#### Transport, storage and communication

For most of these industries base-year gross product estimates are extrapolated by appropriate quantity indicators such as passenger-kilometres, ton-kilometres, quantities of postal articles handled etc. Revenue figures from passenger railway transport and telecommunication services are revalued by appropriate components of the consumer price index.

#### Financing, insurance, real estate and business services

For financial institutions, the base-year gross product is extrapolated by the quantum index of output, obtained by revaluing current-price output by a price index of wages and materials. The base-year product of real-estate and business services is extrapolated by a quantum index of output, which, in turn, is derived by revaluing current-price estimates by the use of wages and employment data. Double deflation is used for ownership of dwellings; current-price output estimates are revalued by using the rent component of the consumer price index, and inputs are revalued by using appropriate components of the same index.

### Community, social and personal services

For public administration, current-price estimates of gross product are revalued by an average earnings index. For defence, current-price estimates of gross product are revalued by a deflator relating to pay for the forces. For community services, entertainment, recreation and personal services, base-year gross product is extrapolated by a quantum index of output. The components are, in the case of most community services, derived by the use of deflators extracted from the corresponding constant-price expenditure-based estimates, for the other services by revaluing the respective current-price estimates by appropriate price deflators.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

The estimates are built up within a framework of purpose categories. For education, specially constructed indexes of salaries and wages paid to primary, secondary and technical teachers and university staff are used to revalue the salaries and wages component; the other purchase components are revalued by special-purpose price indexes of supplies, equipment and transport of school children. A similar approach is used in relation to the other purpose categories specifically treated, except for defence, from 1966/67, in which expenditure on the pay of enlisted and civilian personnel has been revalued by using data on the changes in the number of categories of enlisted and civilian personnel. For the remaining purpose categories, which generally account for less than one third of the total, the current figures are revalued in combination by means of indexes of salaries and wages and prices of selected goods and services purchased.

#### Private final consumption expenditure

For most items, current expenditure is deflated by relevant components of the consumer price index or other appropriate price indexes. Special-purpose price indexes are used for the rent of dwellings and most travel and communication expenditure. Quantity indicators are used for part of the travel and miscellaneous expenditure.

#### Increase in stocks

For each of the stock categories, the increase in stocks at average current quarter prices is obtained by first expressing the opening and closing book value levels at constant (base-year) prices by deflation, using end-of-quarter composite price indexes. The difference between the two constant-price book value estimates (i.e., the value of the physical change in stocks at constant prices) is then revalued to express the flow of stocks at average current quarter prices by using average current quarterly composite price indexes. This revalued flow of stocks represents the increase in stock at average current quarter prices (i.e., the value of the physical change in stocks at current quarter prices). The difference between the increase in book value of stocks and the increase in stocks at average current quarter prices is the stock valuation adjustment.

## Gross fixed capital formation

For gross fixed capital formation in the private sector, dwellings are revalued mainly by the use of special-purpose price indexes for various categories of dwellings, while other buildings and construction are revalued by special-purpose price indexes of wages and prices of material inputs to non-residential building and construction. For motor vehicles expenditure is revalued by using special-purpose price indexes applicable to its major components and, for other capital equipment, expenditure is revalued by using a composite price index, derived by weighting together price indexes for agricultural machinery in the case of the rural sector, and by weighting together price indexes for locally produced and imported machinery in the case of the non-rural sector.

As with government final consumption expenditure, the estimates of public capital expenditure are built up within a framework of purpose categories. The revaluation of each of these categories is effected by means of special-purpose price indexes based on information related to major repetitive processes or recurring asset types, and provided by the appropriate government departments or public enterprises. To a significant extent, the price indexes and the combining weights relate to the cost of direct labour and material inputs. Other types of price indexes used relate to contract prices per unit of output where this information is available. Implicit price deflators are used to revalue expenditure in some purpose categories for which adequate data have not been obtained. Three component series at constant prices related to asset types are also prepared (dwellings, other building and construction and all other).

## Exports and imports of goods and services

Exports and imports of merchandise at constant prices are largely derived by direct revaluation at base-year prices and quantities of goods exported and imported. The balance of these series comprises adjustments to recorded trade data for balance-of-payments purposes, mainly revalued by means of the implicit price deflator of the merchandise components (excluding petroleum and petroleum products in the case of imports). For transportation, revaluation at base-year prices is achieved by using special-purpose price indexes and relevant components of the consumer price index and by using the quantum of total trade or for specified categories (import petroleum etc.). The consumer price index is used to revalue the travel item and selected overseas price indexes are used to revalue travel expenditure of foreign exchange by Australians visiting overseas. Special-purpose price indexes are also used for most government transactions and miscellaneous invisibles.

## AUSTRIA

The presentation that follows is mainly based on a description of the actual national accounts methodology received from the Österreichisches Statistisches Zentralamt (Austrian Central Statistical Office) in July 1978, the report issued by the United Nations Secretariat entitled "Country practices in national accounting at constant prices" (E/CN.3/464) and the revised annex thereto (ST/ESA/STAT.79).



## Introduction

### History

Official national accounting work began in 1951 with the creation by government decree of a national accounts research unit, a few years later continued as a joint undertaking by the Austrian Central Statistical Office and the Österreichisches Institut für Wirtschaftsforschung (Austrian Institute for Economic Research).

A comprehensive revision covering the period beginning 1950 was completed in 1963.

A new comprehensive revision of the national accounts estimates was completed in 1971. <sup>1/</sup>

An "interim revision" of the accounts for 1964 to 1976/1977 was completed in 1978 in which the accounts were to be adapted to the present SNA. The accounts were published late in 1978 by the Austrian Central Statistical Office.

### Approaches used

#### Gross domestic product

Generally the production approach is used to estimate the gross domestic product.

#### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of nearly all industries. The income approach is used to estimate the value added of public administration and defence.

#### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, most of the private consumption expenditure of services, increase in stocks, gross capital formation of construction, and exports and imports of goods and services. The commodity-flow approach is used to estimate gross capital formation in machinery and equipment, and for most goods in private final consumption expenditure.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

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<sup>1/</sup> Österreichisches Statistisches Zentralamt and Österreichisches Institut für Wirtschaftsforschung, Österreichs Volkseinkommen 1954 bis 1968 (Wien, 1971).

Gross domestic product by kind of economic activity

Agricultural statistics

Census of non-agricultural establishments, 1964

Annual industrial statistics

Annual construction statistics

Special surveys of trade and restaurants and hotels

Value-added tax statistics

Housing censuses (decennial)

Government accounts

Turnover and commodity output statistics

Statistics of balance sheets and profit-and-loss accounts of corporate enterprises

Central Bank statistics

Accounting records of large enterprises in various industries

Cost structure of the gross domestic product

Social security and wage statistics

Income-tax statistics

Statistics of corporate balance sheets

Government accounts and records

Expenditure on the gross domestic product

Government accounts and records

Value-added tax statistics

Household surveys (decennial)

Monthly retail trade statistics

Commodity output and input statistics in manufacturing

Registration statistics

Foreign trade statistics

Balance-of-payments statistics

## Methods and sources of estimation

### Current prices

#### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices (including value-added tax from 1973), i.e., producers' values.

#### Agriculture, hunting, forestry and fishing

The value added of agriculture is obtained by deducting the cost of all con-factor inputs from the gross value of production (national farm concept). In the latter figure an imputation for produce consumed on the farms is included. The various calculations and estimates are based on production statistics and producer prices, marketing data and food balance sheets, etc., collected primarily by the Austrian Central Statistical Office (partly through chambers of agriculture), marketing boards and others. Gardening, hunting and fishing are also included in the estimates.

Input costs cover all imported agricultural intermediate goods such as seed, fodder and cattle kept for breeding (national farm concept), re-purchases of locally processed agricultural products such as oilcake and by-products of grain-milling, other inputs such as fertilizers, energy and insecticides, services such as transportation and insurance as well as maintenance and repair. These cost data are partly derived from official and marketing statistics and partly based on the accounting records of representative farms.

The estimate of forestry output is based on data provided by the Federal Timber Council (use of wood), the Federal Ministry of Agriculture (felled trees), and the Austrian Central Statistical Office (prices).

#### Mining and quarrying

The method for mining and quarrying is the same as that used for large-scale manufacturing.

#### Manufacturing

Manufacturing covers large-scale industrial enterprises surveyed by annual over-all censuses as well as small-scale enterprises (handicrafts and the like) surveyed annually by samples (since about 1970). The two sources are combined so that the presentation follows the ISIC classification of major manufacturing groups.

The years between 1964 and 1971 were interpolated primarily on the basis of output statistics in the case of industrial manufacturing, and turn-over statistics in the case of small-scale manufacturing. For 1964 the bench-mark data were supplied by the census of non-agricultural establishments and the input-output study, while 1971 bench-mark data were derived from census for industrial units and from a comprehensive estimate for small-scale units. The latter estimate combined the number of persons employed (based mainly on social security data) with per capita gross and net output, which can be derived from the sample survey.

From 1971 onwards, extrapolation has been based directly on the annual censuses of industrial manufacturing, and on the sample survey and turnover statistics in the case of small-scale manufacturing. Adjustments have to be made for the small-scale sector.

#### Electricity, gas and water

The value added of the electricity, gas and water sector is, in principle, estimated by deducting the value of non-factor inputs from the gross output value. For electricity, annual data are available on production, consumption and external trade of electricity and on purchases of fuels and other inputs. A first estimate of value added is obtained by multiplying the total consumption by the average price per kilowatt-hour, adding exports and deducting fuel costs and imports. Non-material inputs and other unspecified inputs are then taken into account by an adjustment derived from the aggregate profit-and-loss accounts of major companies.

The data for gas production and supply are based on the 1964 industrial census, extrapolated by the annual reports of the Vienna Gas Works and other public enterprises. Since 1973, the annual industrial survey has been the main source for extrapolating the figures for units outside Vienna. A similar method is applied for heating plants.

Value added for the Vienna Water Works, which accounts for half the total water supply, is estimated on the basis of official annual records. The output of other water supply is estimated from an output price indicator and the quantity supplied by all other units, with a net ratio combining the input price index of the Vienna Water Works and the real output index.

#### Construction

For construction and general contractors, census type data on gross output and input have been available annually since 1968.

For special trade contractors, a method similar to that described for small-scale manufacturing is used. Additions are made for own-account construction in agriculture and by private households, but not for construction by other industries.

#### Wholesale and retail trade, restaurants and hotels

The trade sector comprises those enterprises which are mainly engaged in retail or wholesale trade. Estimates on turnover for both subdivisions of the sector are based on the 1964 census of non-agricultural establishments and the 1971 census of turnover of the wholesale and retail trade. Since 1973, annual data on turnover have been available from a sample survey linked to the 1971 gross turnover.

Up to 1973 the net ratio of retail trade was estimated on the basis of a representative survey by a research unit for the trade sector. For wholesale trade an indicator method was used, which took into account real output and input and relevant price components. From 1973 onwards the input ratios have been obtained by combining information from value-added tax statistics and the official survey of sales and merchandise purchases of the wholesale and retail trades. Tax on mineral oil is taken into account as a separate component of value added.

The calculations for restaurants and hotels are based on the 1964 industrial census and on a special survey undertaken in 1972. For the intermediate years, the turnover of this sector is derived from turnover statistics, subsequently from value-added tax statistics. The net ratios are interpolated between the censuses, but kept constant from 1973 onwards.

#### Transport, storage and communication

For railway transportation, communication, water and air transportation, value added is derived from profit-and-loss accounts of the enterprises concerned. For the remaining activities of this sector, bench-mark data have been provided by the 1964 industrial census, extrapolated by means of various indicators (accounting records, transportation statistics, price indexes). Constant net ratios are used for storage, pipelines, driving schools, tourist offices, service stations, taxi-cab and car-rental enterprises. From 1973 onwards, the value-added tax statistics provide useful output data for most transportation other than railways and communication.

Up to 1973 the gross output of road transportation has been extrapolated through a value index based on diesel oil consumed and railway tariffs and slightly increasing net ratios. Later on the value-added tax statistics provide the indicators for gross output, while fuel input is taken into account explicitly, the remaining inputs being covered by a constant input ratio.

#### Financing, insurance, real estate and business services

Value added of the banking institutions is generally obtained directly from their accounting records. In the case of credit unions, investment banks and small private institutions, value added is estimated on the basis of their share in the total volume of deposits and credits outstanding (constant net ratios). Value added for the insurance industry is derived mainly from statistics of the supervisory board. It is obtained by deducting direct claims, additions to reserves and similar adjustments, and intermediate inputs from the gross premiums. For both the banking and insurance sectors, 1964 bench-mark data are extrapolated by the output series described above.

The real-estate sector includes both rented and owner-occupied dwellings as well as real estate rented by business. Estimates of the number of dwellings are based on the decennial housing censuses and official statistics of residential construction, but some adjustments are made to the latter data, since they are incomplete. Estimates of average rentals are obtained from rent prices in the consumer price index and the quarterly microcensus (40,000 private households). An imputation is made for owner-occupied dwellings, based on rents actually paid for comparable dwellings. An adjustment is made to exclude maintenance costs and to include real estate taxes, using data on numerous dwellings rented out by the municipality of Vienna.

Business services are estimated on the basis of turnover statistics (value-added tax statistics since 1973). Rents paid by businesses are estimated on the basis of the 1964 input-output table; the values for extrapolation are estimated by combining an over-all price index derived from the dwellings sector with a real output indicator by subgroup.

## Community, social and personal services

The contribution of public administration and defence is estimated by adding together wages and salaries of government employees, payments to military personnel (including payments in kind), imputed pension payments and depreciation of government fixed assets, and a small amount of indirect taxes paid. All data other than depreciation are available from public sector statistics derived from the accounting records of governments and annual surveys of community budgets. A breakdown by 17 purposes is available for governments other than community authorities.

The estimated contribution to gross domestic product by most of the other services is based on annual turnover statistics and value-added tax statistics and various net-to-gross ratios obtained from the 1964 census of non-agricultural establishments. For broadcasting, annual records are taken into account. The value of domestic services is calculated by means of social security and wage statistics; a similar method applied to health services outside government, for which quantity data are provided by statistics on hospitals (patient days) and personnel in the health services (physicians), priced by the respective social insurance average expenditure. The value added of certain government enterprises (including monopolies) is obtained from the general government budget. Private non-profit services outside health and education can only be roughly estimated on the basis of data on population or membership.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

General government consumption expenditure includes all outlays of the central Government and provincial and local governments for consumption of goods and services. The figures are obtained directly from the accounting records of the various authorities.

#### Private final consumption expenditure

For most goods the commodity-flow method is generally used. The value estimates are obtained either by multiplying the quantity data by average consumer prices or by adding distributive margins and indirect taxes to the value of goods produced domestically or imported.

Primary information obtained by the commodity-flow method is adjusted in most instances in view of the turnover data of retail trade branches. Data on the consumption of unprocessed food and beverages are mostly derived from statistics on agricultural produce; for processed food, industrial output data by commodities are used. For transport equipment, the estimates are based on registration statistics; the corresponding operation costs are calculated by means of average costs per unit. Decennial household surveys provide bench-mark information on average prices of items for which independent quantity information is available, in some instances even by direct information on the respective consumption items (e.g., telephone repair charges).

In the case of most services, the expenditure estimates are based on value-added tax statistics (e.g., hotels and restaurants) or on corresponding data on the supply side. Adjustments for foreign tourism are based on the balance-of-payments and quantity information on tourism.

### Increase in stocks

The item increase in stocks is valued at current prices and covers raw materials, semi-finished goods and finished goods held by the agriculture, forestry, manufacturing, electricity, gas, trade and transport sectors. The statistics available do not permit direct estimates for all branches; those that are not covered are included in the statistical discrepancy attached to this item.

### Gross fixed capital formation

The commodity-flow method is used to estimate gross fixed capital formation in machinery and electrical equipment. The value figures obtained by deducting exports from the sum of domestic production and imports are adjusted to include transport costs, trade margins, customs duties, etc. In the case of transport equipment, the method employed makes use of registration statistics, since these give some indication of the purchaser; the value of each type of equipment is obtained by multiplying the quantity by the current price. Valuable checks are rendered possible by using the annual industrial censuses in manufacturing (large-scale) and construction.

Estimates of the gross value of construction are derived from data on the gross output of building construction (deducting non-characteristic production and estimates for maintenance and repairs). Additions for own-account construction and material provided by the investor are estimated on the basis of special information provided by large investors (such as the railway and the municipality of Vienna) and the annual censuses in manufacturing, as well as bench-mark data from the input-output studies made in 1964 and 1970.

### Exports and imports of goods and services

Exports and imports of merchandise are estimated from foreign trade statistics, while estimates on services are extracted from the balance-of-payments statistics. The services balance is adjusted in order to make a more satisfactory allowance for tourism, because the figures are influenced by remittances of foreign workers and the like. Added to these figures are estimates for transit transactions and adjustment for a statistical discrepancy on the basis of the corresponding balance-of-payments lines compiled by the Austrian National Bank.

### Cost structure of the gross domestic product

#### Compensation of employees

Estimates of compensation of employees are based primarily on the contributions paid by employers into the Fund for Equalization of Family Burdens, but also on social security and wage statistics. In the case of public bodies, the figures are obtained directly from accounting records.

#### Operating surplus

Income from agriculture and forestry is estimated by deducting depreciation, indirect taxes, wages and salaries, interest payments and profits of State forests from the contribution of this sector to the gross domestic product. Estimates of income from unincorporated enterprises, independent professions and property are derived from income tax statistics. Adjustments are made, where possible, to

include incomes on which no tax is paid. Estimates of undistributed profits of corporations are generally based on statistics from corporate balance sheets (compiled by the Austrian Central Statistical Office) and grossed up to allow for limited partnerships, etc. Figures of general government income from property and entrepreneurship are taken directly from the accounting records of public bodies.

This item also includes a statistical discrepancy.

#### Consumption of fixed capital

Stock data were last estimated comprehensively in 1964, extrapolated by estimates which in principle follow as far as possible the perpetual inventory concept (agriculture, manufacturing, public utilities, construction, government, dwellings). For other industries, depreciation is extrapolated by net output at constant prices and inflated by a national accounts price index for fixed capital formation. A more recent investigation into the productive stock of the manufacturing sector (large-scale) made by the Austrian Institute for Economic Research has been taken into account. The depreciation rates are differentiated by various categories of stocks and, in manufacturing, by industries also. There are weaknesses and deficiencies inherent in the data base as well as in the price indexes for revaluating the annual figures to uniform reference-year prices. For industries outside manufacturing, the stock data have not been published so far, because of the reservations mentioned.

#### Indirect taxes and subsidies

Figures on a cash basis can be drawn directly from the records of the various governments, according to the SNA criteria. Minor estimates are required for the identification of fees, fines and penalties.

#### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Double deflation is used; for output, current quantities are valued at average 1962/1966 base-year prices; for input price indexes are available for deflating the separate components. No separate estimate is available for fishing, hunting and gardening, however,

##### Mining and quarrying

The method used for mining and quarrying is the same as that used for large-scale manufacturing.

##### Manufacturing

The estimation at constant prices is based on the index of industrial production (seasonally unadjusted) for most branches of industrial manufacture. The constant net ratio assumption is somewhat modified to take into account the energy and other raw material input, for which substitutions have become more like in recent years. Larger sales of commodities in the condition purchased are also



taken into account. For small-scale manufacturing, double deflation is used, taking into account components for production, trade and services, respectively, each with adequate "synthetic" indexes.

#### Electricity, gas and water

Double deflation is used; for the output of electricity, sales of current (in kilowatt-hours) are valued at the average price per kilowatt-hour in the base year 1964; for input, important materials and fuel inputs, as well as estimated repair and maintenance expenditure, are valued at base-year prices. Except for the Vienna Gas Works, whose constant-price input is obtained by adjusting the consumption of natural gas at 1964 prices, the output and input values of gas works are deflated by appropriate price indexes. Similar methods are used for pipelines, heating plants and water supply.

#### Construction

Output has been extrapolated from 1964 by a volume index representing total production, on the basis of factor and commodity inputs. Since 1971, however, more appropriate price information has become available, used as a gross output deflator. For establishing the value added at constant prices a sort of double deflation is used, where over-all building material consumed is deflated by the wholesale price index. The remaining intermediate goods and services are taken into account by a constant output ratio.

#### Wholesale and retail trade, restaurants and hotels

The turnover of wholesale and retail trade is deflated by the appropriate official price indexes. Since 1973, the indexes of turnover of wholesale and retail trade, calculated officially at constant prices, have been used. The 1964 net ratio is used for wholesale and retail trade. Adjustments are being made for mineral-oil tax and import duties, on the basis of the underlying constant net ratio assumption. For restaurants and hotels, a weighted deflator is used, derived from the materials of private consumption expenditure.

#### Transport, storage and communication

Double deflation is used for the main branches of this sector. The railway output is deflated by a tariff index in the case of personal transportation and extrapolated by ton-kilometres in the case of goods transportation; the inputs are deflated by appropriate prices or extrapolated by quantity. For communication, the output is deflated by a weighted price index of the various services provided, while the input groups are deflated by appropriate price indexes.

Quantum indexes of output and constant net ratios are used for the remaining branches. For the urban and interurban passenger transportation, value added is extrapolated by passenger-kilometres or the number of persons transported. From 1973 onwards, the output of road transport and forwarding has been deflated by railway tariffs for commodity transportation. The number of taxi-cabs is used as an indicator for taxi-cab and car-rental enterprises; for tourist offices the number of stays at home and abroad by Austrian tourists is used, and for driving schools the number of driving licences issued. Output of water transportation is estimated by a weighted index of goods and persons transported, storage by a real index of wholesale turnover. For air transportation, a weighted utilization indicator is used.

### Financing, insurance, real estate and business services

Value added is extrapolated by means of weighted productivity and employment indicators in the case of banking companies and other non-specialized monetary institutions. For the Central Bank and more specialized institutions (including savings banks), special quantity indicators are used. The value added of insurance companies is extrapolated on the basis of series on the number of contracts in force and the claims recorded, both weighted by the relative importance of the various insurance branches.

Double deflation is used for ownership of dwellings; gross rents in the base year are extrapolated by an index for dwelling stocks adjusted for increasing size, changing quality characteristics (e.g., age and equipment), and maintenance expenditure at constant prices is deducted. Real estate by businesses is extrapolated in accordance with the over-all real output of the various industries. For business services, value added is extrapolated by an index of employment allowing for slight productivity changes.

### Community, social and personal services

For producers of government services, various quantum indicators are used (the number of teachers, cases settled, medical personnel, etc. - 10 different components are distinguished), in some instances taking into account capacity (employment) rather than utilization. For producers of private non-profit services to households, basic data are extrapolated by changes in membership or population.

For education, art and recreation, gross output and value added are deflated by various components of the consumer price index weighted together appropriately. Broadcasting output is extrapolated by the number of registered sets and the deflated advertising component. For laundry and cleaning services and for barbers and beauty shops, value added is deflated by the relevant components of the consumer price index. For domestic services, value added is extrapolated by the number of persons employed. Data on health services outside government are extrapolated by the number of physicians and patient-days.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

The value-added component is calculated as described under "Producers of government services" above. The consumption of intermediate goods is deflated by a price index consisting of separate components for health, building construction and other operational costs. The index for health takes into account the cost per patient-day, the medical fee for each treatment and medicine per treatment (social security); for building construction, the price index of building investment is used; for other operational costs, various subcomponents are distinguished, which are weighted together by the structure of the central government expenditure in 1964, the prices being mainly derived from the consumer price index. Receipts from commodity and non-commodity sales are deducted.

### Private final consumption expenditure

Direct revaluation at base-year prices is used where information is available on quantities of commodities consumed. Otherwise, the current estimates are mostly deflated by adequate price indexes for the individual goods and services normally derived from the consumer price index.

### Increase in stocks

Price deflation is used; various indexes are used for the deflation according to the kind of commodity or the kind of stock-keeping industry.

### Gross fixed capital formation

For building and other construction the respective gross output figures are used and appropriately adjusted (see under "Current prices"). For transport equipment, the current quantities are multiplied by base-year prices, while price deflation is used for machinery and equipment, the appropriate price indexes being derived from representative commodity data of industrial production statistics and price trends for exports of machinery by the Federal Republic of Germany.

### Exports and imports of goods and services

Price deflation is used; as a rule merchandise exports and imports are deflated by price indexes derived from the foreign trade statistics, while exports and imports of other goods and services are deflated by price indexes representative of the various components.

## BOLIVIA

The presentation that follows is based mainly on a description of estimation methods received from the Banco Central de Bolivia in June 1978. Supplementary information has been taken from Cuentas Nacionales, 1958-1966, Planeamiento, published by the Secretaría Nacional de Planificación y Coordinación in 1968, and "Country practices in national accounting at constant prices", issued by the United Nations Secretariat (E/CN.3/464).

### Introduction

#### History

The Secretaría Nacional de Planificación y Coordinación in 1966 published Cuentas Nacionales de Bolivia, 1958-1965, containing an analysis of the Bolivian economy and national accounts estimates, including information methodology.

In 1970 the third edition of Cuentas Nacionales de Bolivia 1/ was issued by the Ministerio de Planificación y Coordinación, giving estimates of the national accounts for the period 1950-1969.

## Approaches used

### Gross domestic product

The main approach used to estimate the gross domestic product is the production approach.

### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries, but owing to a lack of information on intermediate consumption, value-added coefficients established from the input-output table of 1958 have been used in most cases. The income approach is used to estimate the value added of public administration and defence and some private industries.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, gross capital formation, and exports and imports of goods and services. Total private consumption expenditure is estimated as a residual.

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Agricultural sample surveys

Current data on agricultural volumes

Mining data from three different sources

Annual industrial statistics

Construction permits

Transport statistics

Government accounts

Accounting statements of financial institutions

Population and housing censuses

### Cost structure of the gross domestic product

Not estimated

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1/ Cuentas Nacionales 1950-1969 (La Paz, Ministerio de Planificación y Coordinación, Revista de Planificación y Desarrollo 1970).

## Expenditure on the gross domestic product

Government accounts

Annual industrial statistics

External trade statistics

Balance-of-payments data

## Methods and sources of estimation

Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

#### Agriculture, hunting, forestry and fishing

For the estimation of the value added of this sector, 133 products and subproducts are taken into account, representing more than 95 per cent of the production. Basically, information relating to production volume is used, estimated on the basis of information on areas sown and production yields prepared by the office responsible in the Ministerio de Asuntos Campesinos y Agropecuarios. Information furnished by the following institutions provides further details and is also taken into account: the Comisión Nacional de Estudio de la Caña y del Azúcar, the Comité Boliviano del Café, the Banco Agrícola de Bolivia, the Empresa Nacional del Arroz, the Asociación de Productores de Algodón, the Instituto Nacional de Estadística, the Centro de Desarrollo Forestal, the Federación de Ganaderos de Santa Cruz y del Beni and the Dirección General de la Renta.

The estimation of gross value of production at current prices is made by using data on physical volumes and producer prices, with relevant adjustments based on certain indicators referring to the production volumes of the sector.

Livestock production is estimated by taking into account the number of existing livestock, and referring to information on meat cutting for domestic consumption and legal exports; illegal exports of livestock are estimated by using an extraction coefficient and prices of livestock at the establishment level.

With regard to intermediate consumption, data from sample surveys obtained from managers in the principal agricultural areas are used, supplemented by costs calculated by some credit institutions (the Banco Agrícola and Banco Central de Bolivia). On the basis of this information, coefficients of intermediate consumption by products are estimated.

Non-marketed agricultural production (seeds and own-account consumption) is included in the gross value of production; it is not possible to prepare estimates in a disaggregated form owing to statistical deficiencies. Agricultural services, however, are included in the government services, or in other community and related services (private share), because of the difficulties of separating the costs of the institutions concerned.

The Centro de Desarrollo Forestal provides statistics on the volume of timber felled, by species, and prices of wood for sawmills, and these make it possible to estimate timber prices.

### Mining and quarrying

The metal mining sector consists of the Corporación Minera de Bolivia, and of medium and small mines. Full coverage is provided by the statistical information in the accounts of the Corporación Minera and the medium-sized mines, supplemented by statistics on production, exports, prices, etc. provided by the Ministerio de Minería y Metalurgia, covering the remaining mines.

The accounts of the mines in the public sector make it possible to estimate their different components. For medium-sized mines, the values are estimated from financial statements; there are, however, some inconsistencies in the information obtained from this source, especially for intermediate consumption, and it therefore has to be supplemented by supporting statistical data from different enterprises. The value of production for the small mines is estimated from export statistics, but for the ratios of intermediate consumption and other items certain modifications have been made in the structure of the medium-sized units, taking into account the characteristics and operating forms of this subsector.

For the petroleum sector, the basic information is presented in an aggregate form, but it has been found convenient to make some adjustments in the accounting system of the public petroleum enterprise in order to separate petroleum refining from the extraction of crude petroleum and natural gas.

### Manufacturing

The estimates for this sector refer, with a few exceptions, to the gross value of production, intermediate consumption, value added and other components classified at the three-digit level of ISIC. The values of artisan production are included in the estimates of manufacturing production and cannot be presented separately.

The estimated values for the period 1970-1975 are based on information obtained from the annual industrial statistics published by the Instituto Nacional de Estadística. The statistical unit of observation is the enterprise, but in most cases it is identified by the establishment. There are a number of serious inconsistencies in this information with respect to volume of physical production, prices and cost structure, so it has been decided to use other more reliable data for comparison and adjustment (from various private and government institutions, studies, etc.). Bench-mark technical coefficients and ratios of the cost structure, etc. have been constructed on the basis of 1973 industrial data.

### Electricity, gas and water

Basic information on electrical energy is obtained from the Dirección Nacional de Electricidad, which controls all the public and private enterprises. Own-account consumption is also covered in the estimates. Gas production forms part of the estimates of petroleum extraction, because of the difficulty of separating the respective costs. For water supply, more than 80 per cent of the production is

estimated from the accounts of autonomous public enterprises, whereas the rest is included in public administration figures. From the above sources it is possible to derive the gross values of production, intermediate consumption and value added with components.

### Construction

The sources used for the construction estimates are the accounts of public institutions, construction permits issued by the municipalities, and financial statements submitted by the construction enterprises to the Instituto Nacional de Estadística and the Cámara Boliviana de la Construcción. The value of production of public construction is computed from the accounts of the different institutions, classified by type of construction. The value of private construction, which is based on the permits issued and classified by the surface area of the various categories, is adjusted by a percentage for planned unfulfilled work, based on the observation of work in progress by experts from the construction enterprises. Average prices per surface area are extracted from cost studies conducted by the Cámara Boliviana de la Construcción and local construction enterprises.

Since no permits are issued, the estimation for rural construction is based on information provided by the Servicio Nacional de Desarrollo de Comunidades and by the Instituto Nacional de Colonización. Intermediate consumption is estimated from the economic forms submitted to the Instituto Nacional de Estadística, with disaggregated expenditure on the different categories of construction. This information only covers La Paz, however,

The estimates for small construction units and own-account construction are included in the production value; it is difficult to estimate these separately for want of statistical data, except in isolated cases like public institutions.

### Wholesale and retail trade, restaurants and hotels

Trade margins are determined on the basis of information on retail prices furnished by the Instituto Nacional de Estadística and the Ministerio de Industria y Comercio and information on wholesale prices obtained from the Banco Central de Bolivia and two government co-operatives. Trade volumes are estimated for domestic agricultural and industrial products; for imported goods, information is available from the Instituto Nacional de Estadística, but for intermediate consumption and factor income components the estimates are based on a sample of 150 financial statements recorded by the Dirección General de la Renta.

In estimating the gross value of production for agricultural products, all products are taken into account; for manufactured and imported goods a sample of 50 and 75 of the most important products is used, the gross trade margins being estimated from price differences for the different products. These percentages (mark-ups) are applied to all products entering the distribution channels.

Direct import by the public sector is deducted, constituting around 25 per cent of total imports. From the gross trade margins for both imported and domestic goods, deductions are made for the corresponding transport production.

For restaurants and hotels, the estimates are based on a sample survey of the principal establishments in La Paz, blown up to cover the whole country, using the number of establishments as indicator.

## Transport, storage and communication

The estimates of railway transport are based on the accounts of the public railway enterprise. The gross value of production for urban passenger transport is estimated on the basis of the number of buses in operation, the daily mileage per bus, passenger volume and average tariffs. For taxi-cabs, a survey has been conducted on daily incomes in La Paz, the value of which has been aggregated on the basis of the number of taxi-cabs operating in the country. Interprovince transport of passengers by bus is measured by the number of passengers transported and the average fares, with an adjustment to allow for insufficient information. The output of road transport of goods is estimated by the volume of goods transported and the average tariffs. Reliable basic statistics on river transport are not available; instead, the payment of 2 per cent taxes on transported goods is considered and adjustments are made to account for the tendency to avoid paying the taxes. With respect to the estimation of value added for these subgroups, a coefficient of intermediate consumption is estimated from the accounting statements presented by the enterprises in charge of the interprovince transport (for taxation purposes).

For air transport, the financial statements of Lloyd Aéreo Boliviano are used and the collection of taxes is charged to foreign air travel enterprises by the State at 3 per cent of the rate values. The input coefficient is estimated on the basis of coverage presented by the State airline.

Finally, value added of storage and communication is estimated from the different financial statements of public and private enterprises.

## Financing, insurance, real estate and business services

Basically, the accounting statements of almost all the financial institutions are taken into account, but for institutes of minor importance use is made of samples, with the prospect of expanding them later. The information presented by the banking system meets the requirements of the national accounts with few limitations, permitting the estimation of production including its imputation, intermediate consumption and other components. For insurance companies the source is the Superintendencia de Seguros y Reaseguros, which classifies and consolidates their accounts, but this information has to be analysed thoroughly before it can be used.

For the remaining financial institutions, the estimates are based on whatever accounting statements are available; in some cases it is necessary to apply to the Dirección General de la Renta and the institutions in question for additional information and in order to make the required adjustments.

For ownership of dwellings, census information on population and housing is used (the latest census was in 1976); statistics on real estate compiled by the Dirección Nacional de Catastro and the rents component of the consumer price index are also used.

Business services are not estimated because the required information is lacking.



## Community, social and personal services

For public administration and defence, information is derived for the most part from the annual financial statements requested by the Banco Central de Bolivia; in a few cases it is obtained from the Presupuesto General de la Nación and previous analysis through coefficients established in periods when the information has been adequate. First, auxiliary tables are drawn up, containing the concepts and accounts used by each of the institutions, and the structure of incomes and expenditure. From these, the gross value of production, intermediate consumption, value added and other components might be estimated, adjusting the information for transfers by means of a cross-check by institutional groups.

In order to define the universe of each activity of private services, resort is had to entities such as the associations of private colleges, professional associations, syndicates, and some public institutions like the Ministries of Health, of Labour and of Education and the mayoral offices in the various administrative districts. For each type of activity for which there are recorded accounts, samples are taken of the most important establishments with respect to the three principal cities. For activities that are not recorded, surveys among establishments are made, defining an average input-output ratio. The calculated average is assumed to be valid for a typical establishment and is multiplied by the number of establishments.

## Expenditure on the gross domestic product

### Government final consumption expenditure

The estimates are based on the annual government accounts, or statements of profit and loss compiled for different general government authorities. For the central Government the information is furnished by the Contraloría General de la República and the Dirección General de Presupuesto y Tesoro General de la Nación. Information on local government is obtained from departmental prefectures and the mayoral offices in the departmental capitals; for decentralized entities it is obtained from the accounts of the social security schemes, the universities and various institutions. This item is classified by wages and salaries (civil and military) and purchases of goods and services.

### Private final consumption expenditure

Total private consumption expenditure is estimated as a residual.

### Increase in stocks

The estimates are based on information on different products obtained from the enterprises concerned.

### Gross fixed capital formation

For the public sector, direct financial statements are available for 95 per cent of the public institutions. The values are expressed at purchasers' prices, i.e., including all the costs directly related to the acquisition and installation of these goods. The estimates are classified by type of goods and subdivisions of the public sector.

With respect to the private sector, reliable statistics are not as yet available, nor are there any samples from which calculations can be made. Nevertheless, the Instituto Nacional de Estadística requests detailed information from the enterprises in the form of financial statements, but this practice varies from one year to the next, also in terms of the number of establishments covered. In order to overcome these problems, various other sources are drawn on. The methodology used to estimate the gross value of production of dwellings, other buildings and constructions relating to the private sector is already described under "Construction" above.

The estimates of transport equipment, agricultural machinery and equipment and other imported machinery and equipment are based on c.i.f. import values classified by use or economic destination after conversion from United States dollars to Bolivian pesos. Later the trade margins and transport expenses are added. Annual industrial statistics are available for capital goods produced domestically. The estimates are classified by type of goods and type of purchaser.

#### Exports and imports of goods and services

Exports of goods and services are estimated from information in the balance of payments compiled by the Banco Central. Export of non-monetary gold is added to the f.o.b. figures. No data are available on freight and insurance, and export of transport services corresponds to income from petroleum sales for air transport.

Imports of goods and services are estimated by the Banco Central and include the total amount of merchandise imports at f.o.b. values, the expenditure on freight and maritime insurance, plus estimates for other services.

#### Cost structure of the gross domestic product

The cost structure of the gross domestic product - compensation of employees, operating surplus, consumption of fixed capital, indirect taxes and subsidies - has not been estimated since 1969.

#### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Value added in 1970 is extrapolated by a quantity index for agricultural output, based on indicators for products covering approximately 95 per cent of the total production value; a quantity index for exports is used for forestry and logging, and a quantity index for quantities consumed is used for fishing.

##### Mining and quarrying

Value added is extrapolated by a quantity index for output, based on an export quantum of mineral products, crude petroleum and natural gas.

##### Manufacturing

Value added is extrapolated by a quantity index for output, based on 240 manufacturing products.

### Electricity, gas and water

Value added is deflated by an index of average tariffs.

### Construction

Value added at constant prices is estimated by multiplying the annual number of square metres authorized by the base-year prices for each category of construction, except for other construction, which are deflated by a price index based on value and volume of imported construction materials.

### Wholesale and retail trade, restaurants and hotels

Value added is deflated by a price index for trade, constructed on the basis of average gross margins and trade volumes for the activity in general, using the Laspeyres' formula in the case of imported goods.

### Transport, storage and communication

Value added is extrapolated by indicators such as goods and passengers transported, words transmitted, etc., but it is also deflated by average tariffs, weighted price index for air transport, a price index for posts and import indexes for storage.

### Financing, insurance, real estate and business services

Value added of banking is deflated by an implicit price index based on the values and number of cheques exchanged; for insurance various indicators are used, whereas the index for banking is used to deflate the value added for the rest of the financial establishments. The value added of ownership of dwellings is deflated by the rent series.

### Community, social and personal services

For public administration and defence, employment data by category are used as extrapolators. Until 1972 government purchases of goods and services were deflated by the import index, and thereafter by the import index in conjunction with balance-of-payments figures. For private services, values are deflated by the price indexes of 15 principal services included in the consumer price index of La Paz.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Wages and salaries are revalued as for the value added of public administration and defence, while purchases of goods and services are deflated by implicit price indexes for the output of supplying industries or the cost-of-living index.

### Private final consumption expenditure

Private final consumption expenditure at constant prices is obtained as a residual.

### Increase in stocks

Price deflation is used; current values are deflated by an index constructed from import data in principal materials and intermediate inputs for the industrial sector.

### Gross fixed capital formation

Price deflation is used; for dwellings and other buildings, current values are deflated by an index of price per square metre by type of dwelling in La Paz and the rest of the country; for other construction they are deflated by the unit-value index of imported construction materials; for imported machinery, equipment and transport equipment they are deflated by unit-value indexes, and for domestically produced machinery and equipment they are deflated by indexes originating in their respective branches.

### Exports and imports of goods and services

Price deflation is used; current values are deflated by unit-value indexes for total exports and total imports.

## BOTSWANA

The presentation that follows is mainly based on information contained in the publication National Accounts of Botswana 1973-74, issued by the Central Statistics Office in 1976. Supplementary information was received from the Central Statistics Office in August 1977.

### Introduction

#### History

The first attempt at constructing national accounts, covering the calendar year 1955 with value added estimates for five production sectors, was made by D. P. Erasmus in 1959. <sup>1/</sup>

The Central Statistics Office, which was set up in 1967 during the first year of independence, began by preparing a preliminary set of national accounts for the calendar year 1965.

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<sup>1/</sup> Published later as "The national income of Bechuanaland Protectorate: 1955", in International Association for Research in Income and Wealth, African Studies in Income and Wealth, L. H. Samuels, ed. (London, Bowes and Bowes Publishers Ltd., 1963).

In 1968 the Central Statistics Office issued its first publication, National Accounts 1964-66, 2/ establishing the nine-sector ISIC approach and setting out detailed tables on household expenditure and general government income and expenditure.

The publication National Accounts of Botswana 1971-72 was issued in 1973, 3/ introducing for the first time constant-price estimates and balance-of-payments data; the calculation of flow-of-funds was by information on income and outlay and on capital finance. The national accounts data were presented with a substantial supporting text.

In 1976 the national accounts of Botswana were for the first time extensively checked for consistency through commodity flows and financial analysis.

#### Approaches used

##### Gross domestic product

The main approach used to estimate the gross domestic product is the production approach.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of almost all industries. The income approach is used for some subgroups of private services, and for producers of government services.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, gross capital formation and exports and imports of goods and services, whereas private final consumption expenditure is estimated as a residual.

#### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

##### Gross domestic product by kind of economic activity

Agricultural surveys

Rural incomes distribution survey, 1974

Study of the mining sector (data supplied by companies)

Census of production and distribution

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2/ National Accounts, 1964-66 (Gaborone, Ministry of Development Planning, Central Statistics Office, 1968).

3/ National Accounts of Botswana 1971-1972, (Gaborone, Ministry of Finance and Development Planning, Central Statistics Office, 1973).

Government accounts (central Government and local governments)

Tourist statistics

Returns from Rhodesia Railways

Population census, 1971

Employment statistics

Cost structure of the gross domestic product

Government accounts

Census of production and distribution

Expenditure on the gross domestic product

Government accounts

Census of production and distribution

External trade statistics

Household expenditure survey, 1968-1970

Methods and sources of estimation

Current prices

Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values. All customs excise and sales duties are treated as collected and paid by the trade sector. In all other sectors value added at market prices and factor costs are almost identical.

Agriculture, hunting, forestry and fishing

For traditional farming (involving approximately 80,000 non-freehold farmers), the annual agricultural survey reports based on agricultural sample surveys carried out by the Ministry of Agriculture are the main source for crops. For cattle the sources used include the rural incomes distribution survey, 1974, annual reports of the Botswana Meat Commission, information supplied by officials in the Ministry of Agriculture, and the Division of Economic Affairs in the Ministry of Finance and Development Planning. Quantities of production etc. are obtained from the above-mentioned sources and unit values obtained from the Ministry of Agriculture, the Botswana Meat Commission, etc. are applied. The data for arable farming are adjusted to account for areas not covered by the agricultural surveys.

Production estimates of sorghum, maize and millet are provided by the survey reports, and estimates of yield per acre for beans and cowpeas and all other crops are provided by the Ministry of Agriculture. Cost of production and the proportion marketed are also estimated.

Sales of cattle production by traditional farmers are estimated from the Botswana Meat Commission's annual reports, the rural incomes distribution survey, 1974, and the agricultural surveys. Estimates of average prices received by traditional farmers for mature animals vary depending on the nature of the sale (cattle slaughtered for home consumption are valued lower). Increase in cattle numbers is estimated from the surveys and valued at approximately half price.

Data from the rural incomes distribution survey, 1974 has for the first time provided reliable information on milk production for own use and the value of consumed meat from dead animals. Using this new source of data, detailed input-output activity analysis of the traditional farming sector is being carried out. Accurate figures are available for sales of milk and cream, but these account for only a small part of the total production. Smallstock production figures are obtained from the agricultural surveys.

The main source of information on freehold farmers' activities is an attempted census of the accounts of all freehold farmers (about 400), including farming partnerships and farming companies. In cases where no response has been received, results have been scaled up by reference to other farms of the same type. In combining traditional and freehold agriculture the two accounts have simply been added, and no attempt has been made to make simultaneous deductions of the large number of cattle purchases and sales within the sector.

Data for hunting are obtained from the Department of Wildlife and National Parks in the Ministry of Commerce and Industry. Data on the collection of firewood and poles and wild food are obtained from the rural incomes distribution survey and supplementary data are available from the Ministry of Agriculture. Inputs are estimated mainly for ammunition, licences and transport costs.

#### Mining and quarrying

The small firms in this sector fill in a questionnaire, while the two large groups of mining companies are interviewed at length regarding their accounts. Sales of products and intermediate consumption include prospecting services sold and purchased, respectively. The accounts are constructed on an accrued basis. Non-mining establishments of mining enterprises are allocated to the relevant production sectors.

#### Manufacturing

Manufacturing is dominated by the Botswana Meat Commission, which still contributes more than 40 per cent of the sector product. The main source is the questionnaire for the census of production and distribution. This census is based on the income and outlay accounts and balance-sheets of a stratified sample of establishments (enterprises) within Botswana, covering all the ISIC sectors. Its questionnaire also gives information for estimating the cost of intermediate consumption, broken down at least into services and goods, further details being provided for some sectors. The census of production and distribution does not, however, give detailed enough information to set up detailed commodity flows to show the "commodity multiplied by industry input" matrix.

The Government Printer's services are included in manufacturing and are valued at cost (previously they had been included under central Government). The output

of village industries is derived from the Rural Incomes Distribution Survey, and includes the activities of basket-weavers, carvers, beer-brewers etc., which take place mainly in rural areas.

#### Electricity, gas and water

Statistical courses for estimation of this sector are the census of production and distribution and a special survey of borehole syndicates. Non-characteristic output of Rhodesia Railways, the Botswana Meat Commission, the mines etc. has been allocated to this sector. Sales of water for watering livestock in rural areas have recently been estimated for the first time.

#### Construction

Private contractors and building brigades are covered by the questionnaire used for the census of production and distribution. The mining company has been interviewed at length in order to separate its construction activities from its mining activities. Smaller amounts of construction have been covered by other sectors: small dams and boreholes built by farmers are covered by agriculture, a certain amount of track-laying and other construction by railway transport, the Borehold Drilling Unit and the Shashe Project Management Unit by the central Government. Estimates on site and service low-cost construction are supplied by city and town councils, while estimates for rural hut construction are derived from the 1974 rural incomes distribution survey. Most estimates are calculated on an accrued basis. Estimates of construction carried out by government departments are derived from the analysis of government accounts.

#### Wholesale and retail trade, restaurants and hotels

This sector covers wholesale and retail activities, hawkers, restaurants, cafés, bars, hotels and small butcheries not large enough to be classified as abattoirs. The main source for the estimation is the questionnaire used for the census of production and distribution. Gross margins are estimated as the difference between sales and purchases of goods for resale. For small establishments and larger traders the data obtained from the census are inflated to allow for undercoverage. Customs, excise and fiscal duties levied on goods bought or imported are treated as indirect taxes collected by the trade sector, and purchases and sales of the sector have been adjusted accordingly.

#### Transport, storage and communication

The main contributor to this sector is the transport service rendered by the section of Rhodesia Railways lying within Botswana, and therefore the most important single source of information is a series of returns received from the General Manager of the Accounting Branch of Rhodesia Railways. They cover the entire system, and contain no separate data on the Botswana section, but can be supplemented upon request. Adjustments are made to convert the data to a national accounts framework, and significant imputations have to be made on the expenditure side.

Other private firms are covered by the questionnaire for the census of production and distribution. Road transport includes interurban passenger bus services, freight transport by road and informal passenger transport in the backs of large lorries whose owners operate private passenger businesses in rural areas.



No measurement of the latter business has ever been attempted, but a rough estimate is made. Air-transport services are included, based on readily obtainable information, whereas no estimate on water transport is made. The accounts of the Post Office are isolated from the rest of the central Government accounts by analysing the Accountant-General's report.

#### Financing, insurance, real estate and business services

The main source of information is the census of production and distribution questionnaire, adjusted for undercoverage. Gross output of financial institutions is made up of two parts, the actual sale of services and an imputed service charge in accordance with international convention, and covers the Bank of Botswana (from 1976), two commercial banks, one building society, the National Development Bank, the Botswana Development Corporation, the Post Office Savings Bank and investment companies and thrift and loan societies. From 1974/75, accounts of insurance companies incorporated in Botswana are also included.

When the full results of the rural incomes distribution survey become available, the data basis for national accounts estimates of modern owner-occupied and traditional owner-occupied dwellings in rural areas will be significantly improved. Average net value added of each modern owner-occupied house in urban areas is estimated net of maintenance costs at 10 per cent of the average capital cost.

#### Community, social and personal services

The most important source of information is the Annual Statement of Accounts of the Central Government, published by the Accountant-General. The second most important source is the accounts of individual local governments, and the main source for all other enterprises is the questionnaire submitted in connexion with the census of production and distribution. A suitable modified questionnaire is sent to non-profit institutions. Data on domestic servants come from the 1971 population census report. Information on traditional doctors comes mainly from the 1974 rural incomes distribution survey. Information on wages and salaries of technical assistance personnel paid by international organizations is derived from an unpublished Central Statistics Office survey. Time-period adjustments are carried out to convert government accounts from an April-March to a July-June basis.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

The estimates are based on annual statements of the accounts of the central Government and the accounts of individual local governments. They are to some extent analysed according to purpose, as computed for each ministry.

##### Private final consumption expenditure

Private final consumption expenditure is estimated as a residual.

##### Increase in stocks

Change in stocks is estimated on the basis of the production census for all sectors covered, including traders.

### Gross fixed capital formation

Government capital formation is estimated from the government accounts, and private sector capital formation from the production census figures for those sectors covered by the census questionnaires. In addition to these figures, the cost of land clearings obtained from the Department of Agriculture and imputed values of new huts are included. Considerable care has been taken to obtain investment statistics for the Shashe complex.

### Exports and imports of goods and services

The estimates of exports and imports of goods and services are based on balance-of-payments data. Estimates were prepared for the first time for the period April 1971-March 1972 by the Ministry of Finance and Development Planning. Exports and imports of goods have to be adjusted for duty content, in accordance with the Southern African Customs Union agreement that reflects the fact that Botswana is a member of the rand currency zone, comprising Botswana, Lesotho, South Africa and Swaziland.

### Cost structure of the gross domestic product

#### Compensation of employees

Compensation of employees is, in general, estimated by using the sources already mentioned (census of production and distribution etc.). In the census, data on payment of wages and salaries are distinguished according to whether they are paid to residents or to non-residents. They are also classified by type, such as payment in cash, payment in kind, employers' contributions to different social security schemes, and other fringe benefits (e.g. free own-produced milk, meat, grain, vegetables etc.)

#### Operating surplus

Operating surplus is, in general, calculated as a residual, deducting intermediate consumption, compensation of employees, depreciation and indirect taxes, net from the gross output of each sector.

#### Consumption of fixed capital

The main source for estimating consumption of fixed capital in the private sector is the census of production and distribution. Depreciation on rolling stock is not included in the estimates, following an international convention in which rolling stock, depreciation, etc. are counted in the "head-office" country only (Rhodesia in this case). For government assets, a linear-scale depreciation is applied, the constant percentage varying according to the different types of assets.

#### Indirect taxes and subsidies

Data on indirect taxes are derived from the Accountant-General's annual statement of accounts, the census of production and distribution, and estimates by the Customs Statistics Unit. Botswana receives a share of the common revenue pool, the amount depending, inter alia, on its share of the total customs union imports. Indirect taxes are imposed on dutiable goods at the first point of entry of the goods into the common customs zone.

## Constant prices

### Gross domestic product by kind of economic activity

The census of production and distribution data are deflated by a cost of living index. No deflation by commodity or sector has so far been carried out.

### Expenditure on the gross domestic product

The expenditure side of the gross domestic product is not estimated at constant prices.

## BRAZIL

The presentation that follows is mainly based on the information contained in Contas Nacionais do Brasil, Conceitos e Metodologia, published by the Instituto Brasileiro de Economia. <sup>1/</sup> Supplementary information was received from the Instituto Brasileiro de Economia in July 1978.

### Introduction

#### History

The first systematic work on national accounting in Brazil was undertaken in 1947 by the Instituto Brasileiro de Economia of the Fundação Getúlio Vargas.

The first estimates of national income prepared by a new national income unit of the Instituto Brasileiro de Economia were published in the September 1951 issue of Revista Brasileira de Economia, relating to the years 1947-1949.

The report Contas Nacionais do Brasil 1947/1961 published data for that period in 1962. In the 1960s early estimates of some aggregates were made by the national accounts unit of the Instituto Brasileiro de Economia.

In 1972 a comprehensive description of the national accounts methodology was published in Contas Nacionais do Brasil, Conceitos e Metodologia. <sup>1/</sup>

Revised and updated estimates were published in the July 1977 issue of Conjuntura Económica in the article "Revisão e atualização das contas nacionais".

A short article entitled "Parametros da economia Brasileira", published in the February 1978 issue of Conjuntura Económica, discussed some of the relationships derived from the 1977 revision and furnished preliminary estimates of the main aggregates for 1976 and 1977.

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<sup>1/</sup> Instituto Brasileiro de Economia, Centro de Contas Nacionais, Contas Nacionais do Brasil, Conceitos e Metodologia, Rio de Janeiro, Fundação Getúlio Vargas, 1972).

## Approaches used

### Gross domestic product

As a general rule the income approach is used to estimate the gross domestic product, but the production approach is also used.

### Gross domestic product by kind of economic activity

The income approach and the production approach are both used to estimate the value added of all industries except the agriculture sector, for which only the production approach is useful.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, increase in stocks, and exports and imports of goods and services. The commodity-flow approach is used to estimate gross fixed capital formation in combination with the expenditure approach, whereas private final consumption expenditure is estimated as the residual of the gross domestic product.

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Annual agricultural statistics

Agricultural censuses

Industrial censuses

Annual industrial surveys

Censuses of commerce

Income-tax returns

Population censuses

Accounting data of financial institutions

Government budgets and accounts

### Cost structure of the gross domestic product

Same sources as above, except for agriculture

## Expenditure on the gross domestic product

Government budgets and accounts

Industrial censuses

Balance-of-payments data

Foreign trade statistics

## Methods and sources of estimation

### Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in net factor values. Depreciation and indirect taxes net of subsidies are estimated as aggregates only.

#### Agriculture, hunting, forestry and fishing

Estimates are based on the production approach, since most of the data available refer to quantities and values of production. Data for factor income are not available for this sector.

The census years 1949, 1959 and 1970 serve as bench-marks. For the first two census years, quantities derived from the censuses have been combined with prices collected by the Department of Agriculture to estimate the aggregate product. The data cover crops, forestry, livestock, derived products (such as eggs, milk, wool, honey and wax, and silkworm cocoons) and fishing. It has not been possible to estimate variations in cattle stock. Value added has been obtained as the difference between the value of gross output and intermediate consumption. The value of intermediate consumption has been checked by comparing data from censuses and other surveys.

For the other years of the period, estimates of gross product are made by the use of value indexes derived from information on quantities and prices collected by the Department of Agriculture and the Fundação Instituto Brasileiro de Geografia e Estatística (FIBGE) for the most important agricultural products. As there are no data for intermediate consumption for these years, the coefficients found for the census years 1959 and 1970 have been interpolated by a linear adjustment. For years after 1970, the census coefficient has been repeated, since an attempt to use an index of the annual consumption of fertilizers and salt consumed by cattle did not prove to be a good indicator.

In the 1960s and 1970s different institutions were responsible for the data for this sector and changes even in the concepts employed were therefore unavoidable. The institutions in question are FIBGE and two agencies of the Ministério da Agricultura: the Equipe Técnica de Estatística Agropecuária and the Serviço de Estatística da Produção.

Values for hunting are not estimated for want of information. Agricultural services are covered by the agricultural censuses. In intercensal years,

production indicators are used for the subsectors, so it is assumed that services are implicitly included; no consistent information is available for them except in the census years.

The forestry and logging subsector is calculated for the census years, for which there are specific items covering such data as production value, expenditure, etc.

It is assumed that the value of production estimated on an annual basis covers small units. In most cases the criteria for surveying data are based not on establishments but on estimated production as a whole, which includes small units, autonomous producers, etc.

#### Mining and quarrying

Here, too, the census data for the years 1949, 1959 and 1970 serve as bench-marks. For other years, value indexes covering three products are used as estimators, since no adequate price series are available for other mineral products. However, the products used - crude petroleum, iron and manganese ores - accounted for practically two thirds of the value added of this sector in the census year 1970. (See under "Manufacturing" for more details.)

#### Manufacturing

The census data for the years 1949, 1959 and 1970 are the bench-marks for the estimations. Value added is computed directly from census values as the difference between value of production and intermediate consumption. Estimations for census years were made at both the national and state levels.

For the remaining years estimations are made only for the country as a whole, by the use of value indexes applied to the figures for 1970. For the manufacturing industry, quantities and prices of some of the most important products are collected from surveys conducted by FIBGE and by Petróleo Brasileiro S.A. (the government-controlled petroleum company). The accuracy of the estimator for the manufacturing industry as a whole is shown by the small adjustment that was needed to adjust the figure generated by the value index for 1959 to the figure obtained from the census for the same year.

To the value added of the manufacturing and mining establishments are added the incomes of self-employed industrial workers.

The income approach is used to estimate compensation of employees for the census years and for 1973, for which the source of wage and salary figures is a survey of industry conducted by FIBGE. The other income components are estimated as the residual of value added for these two industrial sectors.

#### Electricity, gas and water

Bench-mark estimates are based on the industrial census of 1950, the only one that covered this sector.

For 1970 the income approach was used, the main source of data being the demographic census, the balance-sheets of public utility enterprises and business income tax files.

These figures have been interpolated and extrapolated by means of an index of national consumption and the annual average price of electricity. Incomes of the self-employed are added as for the other industries.

### Construction

Bench-mark estimates are based on relationships calculated for 1949, 1959 and 1970, using information from the industrial census in order to calculate the value of production.

For intermediate years some indicators based on the main inputs of construction are incorporated in the estimations. Some checks are performed against data on public works, private housing financing, etc. Value added is calculated using data from the demographic census and business income-tax files as well.

### Wholesale and retail trade, restaurants and hotels

The production approach is used for the trade sector. Bench-mark estimates are based on the censuses of commerce held in 1950, 1960 and 1970. The incomes of self-employed workers, estimated on the basis of the demographic census, are added to the value added of establishments. For non-census years, the estimator used is a value index based on the variations in agricultural, industrial and imported goods.

Small units are covered by the industrial or demographic census (self-employed salesmen). They are, therefore, included in the bench-mark estimates and implicitly in non-census-year estimates, since the indicator used is applied to the total value of the year. The income approach is used to separate compensation of employees from incomes of the other factors of the sector.

Restaurants and hotels are included in community, social and personal services.

### Transport, storage and communication

The income approach is used, but no bench-mark estimates are made from census data such as those available for most of the other sectors. The main sources of information on transport are the Diretoria da Aeronáutica Civil for air transport, the Departamento Nacional de Estradas de Ferro and the Rede Ferroviária Nacional for railways, and the Superintendência Nacional da Marinha Mercante for maritime transport.

For road transportation FIBGE holds special surveys, which include freight and passenger transport, at two-year intervals. As these surveys cover enterprises only, and it is known that most freight is transported by self-employed carriers, the estimates have to be supplemented by data from the demographic census. For non-census years, indexes of the apparent consumption of diesel oil and tyres, among other items, are used as indicators.

For communication, specific sources of financial and quantum data are available for the telephone and postal services, etc. The coverage is nearly universal from 1970 onwards, and the main sources of information are enterprises connected with the Ministério das Comunicações.

Supplements to wages and salaries as well as the remuneration of other production factors, both for transport and communication, are calculated from business income tax files and the sources of information mentioned above.

#### Financing, insurance, real estate and business services

The censuses held in 1950 and 1970 provide the basis for bench-mark estimates for the financial institutions. Estimates for other years are based on profit-and-loss accounting data from various sources.

Rent estimation is based on the demographic censuses (housing censuses) of 1950, 1960 and 1970 and also includes imputed rents for owner-occupied dwellings. These figures are estimated as the product of average rents and the total number of dwellings, both obtained from the censuses. For non-census years the main indicator is the series of property tax revenues.

Business services and the rest of the real estate sector are covered by the service censuses. For the other years indicators are used as for the commerce sector.

#### Community, social and personal services

Data on government payrolls are taken from official budgetary and accounting statements. The principal source in the case of the central Government is the Balanços Gerais da União, supplemented by special inquiries made by the Centre of Fiscal Studies of the Fundação Getúlio Vargas. For state and local governments the sources of information are the Subsecretarias de Economia e Finanças, but because of the increase in the number of municipalities, the value added by them has been estimated from sample data since 1963. Estimates for state government are, however, still based on budgetary and accounting statements.

Social and personal services are estimated as an aggregate that includes domestic services, clergy and religious organizations, independent professionals and also hotel, restaurants and other commercial services. The number of persons engaged in these activities and their incomes are obtained from the demographic censuses. Other remuneration, for commercial services, is derived from the specific economic censuses and interpolated and extrapolated in the same way as for the commercial sector.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

Government consumption expenditure is estimated by the Centre of Fiscal Studies of the Fundação Getúlio Vargas, and is based on information from budgetary and accounting statements of the various levels of government. The estimations cover wages and salaries for public administration and other purchases of goods and services.

##### Private final consumption expenditure

Private consumption expenditure is still estimated as a residual. A continuous effort is, however, being made to prepare independent estimates with the help of information from family expenditure surveys and other sources.



### Increase in stocks

Scattered information is available on the estimates of changes in stocks. The main sources are the industrial and commercial censuses and the industrial surveys. Some information is also available for selected agricultural products, such as coffee and wheat. Stocks for most government enterprises are included in the industrial censuses and surveys.

### Gross fixed capital formation

A mixed approach is used in estimating gross domestic fixed capital formation. Bench-mark estimates have been prepared for 1949, 1959 and 1970, based on information from the industrial censuses for the domestic production of capital goods and on foreign trade statistics for imported capital goods. With regard to automobiles, it is assumed that 25 per cent of the value constitutes capital formation. Arbitrary shares allocated as investment are also stipulated for other commodities. The bench-mark estimates are extrapolated by means of an index of material purchases, adjusted for business mark-ups and value added; imported capital goods are adjusted for business mark-ups. These mark-ups are derived from the business income-tax files.

In the case of construction the statistical sources available for the estimation are relatively limited. For urban construction, bench-mark estimates are prepared on the basis of information on construction materials obtained from the industrial censuses held in 1950, 1960 and 1970. The census figures are adjusted by the values of exports and imports of construction materials. From the 1950 industrial census it was possible to calculate the coefficient of primary materials to gross value of production for the construction sector, and the bench-mark estimates are extrapolated by the use of an indicator made up of the consumption of construction materials and wholesale prices. Bench-mark estimates for rural construction are based on information extracted from the censuses of agriculture held in 1940 and 1950, and the demographic censuses of 1950, 1960 and 1970. In order to interpolate and extrapolate the bench-mark estimates, use is made of the estimated growth of rural population and a general price index.

Estimates of government fixed capital formation are obtained separately from budgetary and accounting statements; therefore, fixed capital formation in the private sector can be estimated as a residual.

### Exports and imports of goods and services

Data on exports and imports of goods and services are prepared in United States dollars by the Balance-of-Payments Division of the Economic Department in the Central Bank. The rate of exchange used to convert exports and imports into cruzeiros for national accounting purposes consists of average exchange rates fixed by the Central Bank for purchases of foreign exchange by the monetary authorities. Sources used for the estimation of the various goods and services include the National Statistical Exchange Operation, the National Superintendence of the Merchant Navy, the Information Centre (Economic-Fiscal) of the Ministry of Agriculture and others.

No special adjustment has been made in the preparation of the merchandise estimates.

## Cost structure of the gross domestic product

### Compensation of employees

This item has been estimated for 1949, 1959 and from 1970 on in combination with the operating surplus. Estimates for wages and salaries are based on the demographic and economic censuses. For non-census years, social security data are used as estimators.

### Operating surplus

Operating surplus is still calculated as a residual. The data available on interest paid to households are very much underestimated, making it hard to separate one return from the others.

### Consumption of fixed capital

Depreciation is estimated for all years at 5 per cent of the gross domestic product. This rate is based on an inquiry covering a number of years. The depreciation estimate has only been checked indirectly by using the business income-tax data. Some inconsistency has been found, but no adjustment has been possible up to now.

### Indirect taxes and subsidies

Estimates of indirect taxes and subsidies are obtained from the federal, state and municipal budgets and balance-sheets.

## Constant prices

## Gross domestic product by kind of economic activity

### Agriculture, hunting, forestry and fishing

The 1970 value added is extrapolated by a quantity index of output for each of the three subsectors - farming, livestock production (including hunting and fishing) and forestry.

### Mining and quarrying

A quantity index of output based on the production data for the three most important mineral products is applied to the value added of 1970.

### Manufacturing

The value added is extrapolated by a quantity index of output, based on production data for approximately 400 products.

### Electricity, gas and water

The estimation of this item is based on the production of electricity.

### Construction

Value added is extrapolated by an index based on the production of principal materials used in the sector.

### Wholesale and retail trade, restaurants and hotels

Value added is extrapolated by a quantity index of output, constructed as a combination of indicators for the production volumes of the agriculture and industrial sectors, and a quantum index of imports.

### Transport, storage and communication

Value added is extrapolated by various indicators of output, such as passenger-kilometres and ton-kilometres for railways and air transport, the number of vehicles for road transport, departing and arriving passengers and an indicator of merchandise shipment for maritime transport, and the number of telephone calls and the number of letters and telegrams sent and received for communication.

### Financing, insurance, real estate and business services

Value added is deflated by the cost-of-living index.

### Community, social and personal services

The value added of public administration and defence is deflated by the implicit price index of gross domestic product, and the value added of other private services is deflated by the cost-of-living index.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

Government consumption expenditure is deflated by the implicit price index of gross domestic product.

#### Private final consumption expenditure

This item is calculated as a residual.

#### Increase in stocks

Current values of this item are deflated by the general wholesale price index.

#### Gross fixed capital formation

The gross fixed capital formation of the base year is extrapolated by different volume indexes. These are based on the index for construction and on the national production and imports of capital goods. The aggregate index is obtained by using the relative weights of domestic production of equipment, imports of equipment, and urban and rural construction.

## Exports and imports of goods and services

Exports of goods and services are usually taken as the national capacity to import. Therefore, to obtain the series at constant prices, an index of the quantum of exports of goods adjusted by the variation in the terms of trade (i.e. the relation between export and import prices) is applied to the value of 1970 exports of goods. The value of total exports of goods and services is a result of the expansion of the value of exports of goods, at constant prices, by the relation (for every year) between total exports and exports of goods at constant prices.

Exports and imports of goods and services are, in addition, estimated at constant prices by using volume indexes of exports and imports, respectively, but adjustments are made for coverage of services.

## CANADA

The presentation that follows is mainly based on the comprehensive information on sources and methods contained in volume 3 of National Income and Expenditure Accounts, published by Statistics Canada in September 1975. The descriptions on constant-price estimates are based on the United Nations report entitled "Country practices in national accounting at constant prices" (E/CN.3/464) and the annex thereto (ST/ESA/STAT.79). Supplementary information was received from Statistics Canada in November 1978.

## Introduction

### History

Official estimates for the inter-war period, based mainly on the production approach, were published in 1941 by the Dominion Bureau of Statistics, following estimates of national income based on the income approach, which were published by the Bank of Nova Scotia and by the Royal Commission on Dominion-Provincial Relations before the Second World War.

The first basic reference document on the income and expenditure accounts was published in 1952, containing annual estimates for the period 1926-1950, and quarterly estimates have been prepared from 1953 onwards.

A major revision was completed in 1958 and the results were published in National Accounts, Income and Expenditure, 1926-1956, which also provided a complete description of concepts, sources, and methods and introduced the concept of gross domestic product for use.

A basic reference document, Indexes of Real Domestic Product by Industry of Origin, 1935-1961, covering all industries in the economy, was released in 1963.

In 1968, revised industry estimates were published in Indexes of Real Domestic Product by Industry (1961 Base).

National Income and Expenditure Accounts 1926-1968, published in 1969, represented the first stage of a complete and comprehensive revision of the Canadian national income and expenditure accounts. The new accounts incorporated major statistical revisions and changes in definitions and structural presentation, and a closer relationship to accepted international standards as represented by the revised SNA.

The second stage of the comprehensive statistical revision began in 1969, and was completed in 1972 with the release of revised data for the years from 1947 onwards. The complete historical record, National Income and Expenditure Accounts, volume 1, The Annual Estimates and National Income and Expenditure Accounts, volume 2, The Quarterly Estimates, was published in 1976 by Statistics Canada.

In 1977 a revised version was released of Real Domestic Product by Industry, covering the period 1961-1971.

#### Approaches used

##### Gross domestic product

The estimates of gross domestic product are mainly based on the income approach.

##### Gross domestic product by kind of economic activity

The income approach is used to estimate the value added of the various industries, except in the case of agriculture, for which the income approach is combined with the production approach through the construction of an operating account for agricultural activity.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate all the different types of expenditure - government final consumption expenditure, private final consumption expenditure, increase in stocks, gross fixed capital formation, and exports and imports of goods and services.

#### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

##### Gross domestic product by kind of economic activity

Annual and monthly surveys of employment and earnings and production

Tabulations of financial data from corporations

Income-tax data

Government accounts and records

Various annual, decennial and quinquennial censuses

Agricultural surveys

### Cost structure of the gross domestic product

Annual and monthly surveys of employment and earnings and production  
Tabulations of financial data from corporations  
Income-tax data  
Government accounts and records  
Various annual, decennial and quinquennial censuses  
Agricultural surveys

### Expenditure on the gross domestic product

Government accounts and records  
Retail sales statistics  
Censuses of merchandising and services  
Agricultural surveys  
Annual censuses of mining and manufacturing  
Annual investment surveys  
External trade statistics

### Methods and sources of estimation

Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

In the industrial distribution of gross domestic product, the largest single component - wages, salaries and supplementary labour income - is classified by industry on the basis of establishment data. Net income of non-farm unincorporated business is partly compiled on an establishment basis, and accrued net income of farm operators from farm production on an activity basis not too far, in the majority of cases, from the concept of the establishment. Other major elements of the gross domestic product that cannot be obtained on an establishment basis are corporation profits, corporate capital allowances, and some elements of investment income. In these cases the data are reported by the company, and the unit of classification must necessarily be based on this broader statistical entity. These particular components of the gross domestic product therefore have to be assigned to the industry in which the company is principally engaged. The differences in classification give rise to some distortion in the industrial distribution of the gross domestic product, but there is at present no alternative method of dealing with this problem.

Most of the components of the gross domestic product at factor cost are built up from industry data in the first place, and no special allocative procedures are required to derive the industry estimates. Thus wages, salaries, and supplementary labour income, net incomes of farm and non-farm unincorporated businesses, corporation profits, and capital consumption allowances are essentially built up by assembling data on an industry-by-industry basis. The sources and methods underlying the preparation of these estimates are described below in the chapter dealing with the cost structure of the gross domestic product, particularly in the case of compensation of employees. In the case of some categories of investment income, such as net bond and mortgage interest paid by industry (i.e., interest paid less interest received) and miscellaneous elements of investment income, separate estimates on an industry-by-industry basis have had to be developed.

Certain imputations are made to include non-market activities. They are allocated to their appropriate industry of origin in the industrial classification of the gross domestic product, and consist of imputed net rents on owner-occupied housing, classified under the financing, insurance and real estate industry, farm products consumed directly by farm households, food and lodging provided to employees instead of wages, allocated to the industry in which the particular "income in kind" originates, and depreciation on government fixed assets, allocated to the three main industrial groups; all imputed banking services rendered without charge to persons and governments are shown as originating in financing, insurance and real estate.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

The estimates of government final consumption expenditure are based on the public accounts and financial records of the various levels of Government and the financial statements of the various government boards, agencies and commissions. At the federal level the data are converted to a calendar year basis using monthly information from the published statements of the financial operations of the Government of Canada. At the provincial level the information is obtained from the public accounts of the provinces, and from the annual reports of the provincial boards and agencies. These data are converted to calendar years using quarterly financial statements submitted to Statistics Canada by the various provinces. At the local government level the estimates are derived from compilations of data received from the various Departments of Municipal Affairs, and from reports to the Tax Structure Committee of the Federal-Provincial Conference on Tax-Sharing Arrangements. Information on the financial operations of school boards is obtained from data assembled by the Education, Science and Culture Division of Statistics Canada. Expenditure of public general hospitals is also included in the government sector, with data based on annual surveys undertaken by the Health and Welfare Division of Statistics Canada.

At the federal and provincial levels the figures are derived through a residual approach, by eliminating from total government budgetary expenditures all outlays that are not made directly to purchase new goods and services. A number of adjustments are then made to this residual figure. The gross fixed capital formation portion is calculated separately on the basis of the series of reports entitled Private and Public Investment in Canada: Outlook. Government current expenditure on goods and services is taken as the difference between total government expenditure on goods and services (calculated residually as above) and

government gross fixed capital formation. At the local government level, the estimates of expenditure on current goods and services are built up directly on a gross basis from the various data sources described above. Revenues from sales of goods and services are deducted. In the case of hospitals, deductions are made from the total expenditure data to eliminate interest expenditure, to offset revenues from sales of goods and services, and to replace book depreciation with an estimate of capital consumption at replacement cost.

#### Private final consumption expenditure

The method of estimating consumer spending on goods involves a number of procedures in which basic primary data on total retail sales are adjusted and supplemented by data from other sources to build up an estimate of total consumer outlays for goods. Bench-mark values of total retail sales are first established from the censuses of merchandising and services held in 1951, 1961 and 1966. To these totals are added estimates of the value of commodities purchased by individuals through non-retail trade outlets. The totals so obtained are then broken down into appropriate trade groupings. For each one of the trade groupings the sales are later adjusted, if necessary, to remove non-personal commodity purchases and receipts for services sold at retail trade outlets, and a deduction is made to adjust for the trade-in value of used goods. Each of the major trade groups is in turn broken down into the various commodity groupings.

For the non-census years, annual estimates of consumer spending on goods are derived essentially by taking the census bench-mark figures on sales for each trade group to interpolate or project these figures by using the movement of sales of equivalent kind-of-business groupings found in the annual retail trade publications issued by Statistics Canada. A large amount of annual information on retail sales is available from these sources. For the non-retail trade groups, surveys of wholesale and service trade, annual surveys of direct selling and surveys of vending machine sales are used. The regular annual retail trade surveys provide breakdowns by major commodity groups. Finally, provincial and local sales taxes are added to the commodity groups to which they apply. Food and fuel produced and consumed on farms, food of non-farm workers and issues in kind to the armed forces are also added.

For certain classes of services (laundries, etc., transport and communication, health care, education) annual surveys or published reports of Statistics Canada and other agencies give information on personal expenditure. Estimates for other groups are based on the decennial censuses (and the 1966 census) of merchandising and services, projections to other years being made on directly related series. In some cases (for associations, political parties, barber-shops, etc.), bench-mark estimates are taken from census data, but the projections must be made on indirect evidence regarding trends. In a number of cases the estimates are explicitly articulated with calculations on the income side.

Net personal expenditure abroad is estimated from basic data supplied by the Balance-of-Payments Division of Statistics Canada.

#### Increase in stocks

For inventories held on farms and grain in commercial channels, comprehensive figures on the quantities of physical stocks are available from the Agriculture Division of Statistics Canada. The values of physical change are calculated



directly by using appropriate prices. Data on changes in inventories held by government commodity agencies and changes in holdings of uranium stocks are obtained from government records.

Investment in non-farm business inventories is estimated initially on the basis of reported book values. As inventory gains or losses reflected in the book values are inappropriate for national accounting purposes, they have been removed by an inventory valuation adjustment. The estimates of inventory book values are available for the majority of industries through annual censuses or sample surveys carried out by Statistics Canada. Estimates for the remaining industries are based on data obtained from a number of other sources, including special tabulations, summaries of taxation statistics and published annual reports of companies.

#### Gross fixed capital formation

Estimates of total gross fixed capital investment are made available through the annual surveys undertaken by Statistics Canada in co-operation with the Department of Industry, Trade and Commerce. The figures are published annually in the Private and Public Investment in Canada: Outlook reports. Data on gross fixed capital formation for government are taken directly from these reports, subject to some rearrangement and adjustment to conform to the definitions and classifications used in the national accounts.

The housing estimates in the reports draw heavily on the extensive field survey work undertaken by the regional offices of the Central Mortgage and Housing Corporation, which provides basic information on new housing starts and completions each year. Estimates of the value of housing construction put in place are obtained by combining the data on starts and completions with information on average construction time, the type and size of dwelling, and average unit costs.

Non-residential construction is classified into four main groups of construction activity - building construction, highways, bridges and streets, railway construction, and other engineering construction. Virtually all of the data necessary to construct the estimates of non-residential construction are available from the large-scale survey mentioned above, which covers approximately 24,000 establishments. The figures in the survey are prepared separately for residential construction, non-residential construction, and machinery and equipment, essentially as reported by business firms, Governments, non-profit organizations and other institutions from their own accounting records, but with some requisite regrouping and reclassification of items. Some relatively small adjustments to take into account scrap and salvage allowances on used machinery and equipment are based on sources other than the private and public investment surveys.

#### Exports and imports of goods and services

The estimates are based on information assembled in the Balance-of-Payments Division of Statistics Canada. For merchandise, the export and import figures are basically obtained from the customs entries, but some adjustments are necessary in order to reflect more accurately their implications for the balance of payments.

The estimates of non-merchandise transactions draw upon a wide range of source material. Sources included are surveys of business firms, records of border crossings and surveys of travellers' expenditure, statistical information from the

Department of Manpower and Immigration and correspondence with foreign Governments, information reported by railway, shipping, air, truck and pipeline operators, information on Canadian gold production and use, and many other sources of information.

## Cost structure of the gross domestic product

### Compensation of employees

The general method used in the preparation of the labour income estimates consists in calculating the payments made on labour account by the various industrial groups and summing the results. In recent years, by far the greater portion of the estimate is based on monthly and annual samples or full-coverage surveys conducted by Statistics Canada, decennial and quinquennial censuses, and published statements of governments. In areas where the annual coverage is incomplete, bench-mark estimates are developed from the decennial censuses of population, agriculture and distribution, while interpolation or projection techniques are employed to obtain estimates for intercensal years, using indexes of aggregate earnings, employment, and wage rates from various sources. In some few instances indirect methods of estimation have to be devised. A new source of information that has been available since 1966 and used to provide a control total for the labour income estimate consists of the tabulation of total wages and salaries submitted by employers with respect to employees' earnings, undertaken by the Department of National Revenue in connexion with the administration of the Canada Pension Plan.

Wages and salaries including allowances in agriculture are estimated mainly by the Agriculture Division of Statistics Canada, using census data and a combined index of the number of paid workers and wage rates in agriculture. For forestry, wages and salaries are calculated from employment data derived from surveys of both large and small establishments, combined with information on average weekly earnings in the larger establishments. Bench-mark estimates for fishing are derived from the population censuses, extrapolated on the basis of the value of fish landings reported. A similar method is used for hunting and trapping, using the value of fur production as indicator. For mines, quarries and oil-wells, the estimates are derived from the monthly employment surveys of larger and smaller establishments, combined with data on average weekly earnings in the group comprising larger establishments. The basic estimates of wages and salaries in manufacturing are derived from the annual censuses, which include quite comprehensive data. For electricity, gas and water, the estimates for wages and salaries are mainly derived from annual surveys. The method used for forestry and mining is also used for construction. This method can also be applied fairly well to the trade sector, but in the latter case censuses of distribution provide bench-mark estimates. For transportation, the greater part of the estimate for recent years is derived from annual surveys conducted by Statistics Canada. Wages and salaries paid for taxi services are estimated on the basis of census information extrapolated by a constructed pay-roll index for transportation, storage and communication. For the storage industry, annual survey data are available for warehousing, whereas the estimates for grain elevators are based on monthly data collected through the employment surveys of larger establishments. For communication, the estimates are based both on annual surveys and on public accounts. For financing, insurance and real estate information from the Canadian Bankers' Association has been used. For business services, basic data on wages and salaries are mostly obtained from the census of merchandising, with extrapolation

based on pay-roll indexes derived from survey estimates of employment, combined with estimates of average weekly earnings in the larger establishments. The estimates for community, social and personal services are based on a wide variety of sources; annual reports, special surveys, employment and pay-roll indexes, etc.

For public administration and defence, the wages and salaries paid in federal and provincial administration are derived from the public accounts, and from monthly survey data for a number of provinces. The estimates for local administration are based on annual and monthly surveys conducted by the Public Finance Division. Data on military pay and allowances are supplied by the Department of National Defence. The value of board and lodging received by employees is estimated separately for industries in which they are important (agriculture, forestry, water transport, hospitals, religious institutions and domestic service). Employers' contributions to pensions, social insurance and welfare funds on behalf of employees are also estimated separately by industry, using as sources the Trusteed Pension Plans - Financial Statistics Catalogue, data from annual surveys, the tabulation by the Department of National Revenue of employers' taxation reports, data supplied by the Unemployment Insurance Commission, and some other reports.

### Operating surplus

The estimates of corporation profits are based essentially on tabulations of corporation financial data which are undertaken by Statistics Canada in collaboration with the Department of National Revenue. The publications Corporation Financial Statistics and Corporation Taxation Statistics by Statistics Canada now constitute the basic source of information for estimating corporation profits as entered in the national accounts. A large number of adjustments to the basic source material are necessary, mostly for conceptual reasons. The basic source material consists of corporate book profits, net of losses and after provision for income taxes obtained from Corporation Financial Statistics and certain items as reported in company books.

Estimates of interest and miscellaneous investment income, which include the interest and miscellaneous investment income of persons and the profits of government business enterprises, are based on information from the Department of National Revenue, Bank of Canada, the Central Mortgage and Housing Corporation, the Inspector-General of Banks, the public accounts and financial statements of governments and their corporations, and others.

The methods of estimating net unincorporated business income can be classified broadly into four main groups - the synthetic operating account method, wherein estimates of gross income are obtained and brought to a net basis by subtracting expenses, the ratio method wherein estimates of gross income are obtained and brought to a net basis by the application of a ratio of net to gross income based on survey or income-tax data, the direct inquiry, and projection from bench-mark data. The estimates themselves can be grouped under three broad headings - net professional income, net income of other unincorporated non-farm businesses, and net rental income of persons.

The basic estimates of net income of farm operators from farming operations are prepared by the Agriculture Division of Statistics Canada and adjusted to meet national income and expenditure definitions. In computing the estimates the Agriculture Division constructs a synthetic operating account for the agricultural

activity, including farm cash receipts, income in kind, physical change in farm inventories, and farm operating expenses. The estimates are based on a wide range of sources and methods, including data from the Canadian Grain Commission, the Department of Agriculture, agricultural censuses, monthly farm price surveys, and the 1958 farm expenditure and income survey.

#### Consumption of fixed capital

Information on corporate depreciation of non-residential construction, machinery and equipment is obtained from essentially the same sources as those used for the estimates of corporation profits. In some instances additional sources are drawn on. A number of adjustments are made to the basic figures, but the estimates of depreciation are (with certain exceptions) calculated on an original cost valuation basis with a close link to the figures of book depreciation reported in the accounting records of business firms. Depreciation charged by government enterprises are mainly compiled from published reports or accounting statements of the enterprises in question. Capital consumption allowances are imputed for the government sector. Replacement cost estimates of capital consumption are prepared for the sectors of agriculture and housing, calculated by the Agriculture Division of Statistics Canada and by the Construction Division respectively from estimates of fixed reproducible capital at market values.

#### Indirect taxes and subsidies

The figures of indirect taxes represent collections of indirect tax revenue, which is not adjusted to an accrual basis to allow for the time-lag for the taxes to be remitted from business to the Government. In general, the data on collections are based on official accounting records of the various levels of government. Indirect taxes are paid to the federal Government and to provincial and local governments. The greater part of the subsidies consists of federal production and consumption subsidies, although provincial governments also pay subsidies for certain purposes.

#### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Double deflation is used for agriculture; for output the detailed quantities of marketed farm products, inventory changes and income in kind are combined by using base-year unit values; for input selected items are deflated by appropriate price indexes. For agricultural services, the value added is extrapolated by the output of agriculture, and for hunting and trapping it is extrapolated by the number of wildlife pelts by type. In the case of logging, the value added is extrapolated by the quantities of principal products and some inputs valued at base-year unit values, whereas the value added of forestry services is extrapolated by using the volume index for the output of logging. For fishing, the value added is extrapolated by a volume index of output based on the quantities of sea and inland fish that are landed.

### Mining and quarrying

For each mining industry, the value added is extrapolated by a quantity index for output based on the quantities of commodities produced.

### Manufacturing

Double deflation is used for most industrial groups. The full range of commodity detail for outputs and inputs is deflated by industry selling price indexes or a variety of specially constructed price indexes. In some cases outputs and/or inputs are valued at base-year unit values or deflated by cost of production price indexes.

### Electricity, gas and water

Double deflation is used for electricity; output revenue is deflated by specially constructed price indexes and fuel used for input is valued at base-year unit values, whereas sales of gas for commercial and industrial use are combined by using base-year unit values.

### Construction

For residential contract construction, the base-year values are extrapolated by an index of work put in place, for non-residential building and other engineering construction they are deflated by cost-of-production price indexes based on labour and material costs, for highway and bridge construction they are deflated by estimated output price indexes, and for repair and maintenance they are deflated by an implicit price index constructed from the above components.

### Wholesale and retail trade, restaurants and hotels

For the trade sector, value added at the individual trade level is extrapolated by volume indexes of output obtained by price deflation; for both wholesale and retail trade the extrapolation is done by deflating the sales of each trade branch by specially constructed price indexes. For restaurants and hotels, the value added is extrapolated by volume indexes of output obtained by price deflation, using components of the consumer price index.

### Transport, storage and communication

Double deflation is used for railway transport and air transport; for railways, output is deflated by appropriate price indexes, and for air transport by valuing passenger-miles, commodity ton-miles, etc. at relevant base-year unit values. In most cases inputs are weighted with base-year unit values. Price deflation is used for taxi-cab operation, truck transport, pipeline transport, part of water transport, services incidental to transport and part of storage and warehousing. Freight revenue from water transport is extrapolated by using total tons handled by ships of Canadian registry, and a similar method is applied to services that are incidental to water transport. Volumes of grain for which storage, drying, cleaning and elevation services are provided are weighted with the base-year average charges. Telephone, telegraph and cable systems are estimated using deflation methods.

## Financing, insurance, real estate and business services

For financial institutions and insurance, the value added is extrapolated by employment and quantity indexes of services produced, rents are extrapolated by estimates of total housing stocks, while employment indexes or quantity indicators are used to extrapolate the value added of other business services. Advertising services, however, are deflated by a composite index of advertising rates by media.

## Community, social and personal services

For producers of government services and producers of private non-profit services to households, various indicators are used to extrapolate or deflate value added; for example, for local and provincial government services, the wages and salaries are deflated by an index of wage rates, for federal Government they are extrapolated by the number of employees, classified by categories and weighted with base-year average earnings; for value added of hospitals they are extrapolated by an index of services produced. A variety of indicators are used for private services; for health services the earnings are deflated by an index of doctors' and dentists' fees or extrapolated by the number of practitioners, for labour organizations and trade associations they are extrapolated by an index of memberships and for recreational services they are deflated by components of the consumer price index or extrapolated by employment data. The same degree of complexity may also be observed in the case of personal services.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Wages and salaries at constant prices are measured by extrapolating the base-year average wages and salaries by employment data adjusted for changes in the employment structure. Other current expenditure by government is deflated by base-weighted price indexes designed to reflect the content of expenditure on goods in the base year, compiled separately for defence and non-defence expenditure.

### Private final consumption expenditure

Price deflation is used; current estimates providing as much detail as possible are deflated by appropriately constructed price indexes. If final market prices are not available, in particular for some services, indexes of wage rates are used as proxies.

### Increase in stocks

Price deflation is used for non-farm stocks; almost all the price indexes selected are components of the consumer price index and industry selling prices. For manufacturing and wholesale and retail trade, the price series chosen are weighted by the estimated commodity content of inventories built up from data on the value of materials purchased and the destination of products and sales by kind of business; for other industries they are weighted by commodity groups on the basis of available data from various sources. The constant price series of farm inventories is derived by valuing the physical quantities of stocks in prices relevant to the base period chosen.

## Gross fixed capital formation

Price deflation is used for non-residential construction and machinery and equipment. For non-residential construction, the value series are deflated by weighted material and labour input price indexes adjusted for changes in productivity and profit margins, with the following exceptions: highway construction is deflated using specially constructed indexes of final bid prices, and for electric utilities and railway construction the price index is based on material and labour inputs, no adjustment being made for productivity or profit margins. The current series of machinery and equipment purchases by industry are deflated by using end-product price indexes based on the cost of machinery and equipment to business and government. The constant-price estimates of residential construction are derived by multiplying the quantity of work put in place by the base-year average unit value.

## Exports and imports of goods and services

Merchandise exports and imports are each revalued by specially constructed current-weighted indexes, derived from a deflation of the merchandise data at a fine level of detail, price relatives being derived for the most part from foreign trade statistics, appropriate specified selling prices from industry statistics, etc. Exports and imports of other goods and services are deflated by representative price indexes.

## CHILE

The presentation that follows is mainly based on a detailed description of national accounting practices received from the Oficina de Planificación Nacional in May 1978. Other sources used are the report on methods used by Chile in estimating the gross domestic product by industrial origin, written by a United Nations expert in the late 1960s, Cuentas Nacionales de Chile 1960-1975, published by the Oficina de Planificación Nacional in 1976, and the report prepared by the United Nations Secretariat entitled "Country practices in national accounting at constant prices" (E/CN.3/464).

## Introduction

### History

The first estimates of Chile's national income were prepared by R. Simón and published in 1931 in Determinación de la Entrada Nacional de Chile.

In 1946, national income estimates were published in two volumes, entitled Renta Nacional 1940-1945, by the Corporación de Fomento de la Producción as part of a study on the Chilean economy.

In 1949 the first comprehensive national accounts were prepared for Chile, integrating estimates of gross national product and personal consumption expenditure. In 1952 the Instituto de Economía published the series in Cuentas Nacionales de Chile; this publication series was later issued by the Corporación de Fomento de la Producción (in 1957, 1960, 1963 and 1964). From 1965 onwards, the Oficina de Planificación Nacional started publishing national accounts estimates.

In 1976 and 1978, the Oficina de Planificación Nacional published Cuentas Nacionales de Chile 1960-1975 and Cuentas de Producción y Distribución del Ingreso 1960-1975, and Cuentas Nacionales de Chile 1972-1977.

#### Approaches used

##### Gross domestic product

The main approach used to estimate the gross domestic product is the production approach.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries. The income approach is used to estimate the value added of producers of government services, business services and domestic services.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, increase in stocks, and exports and imports of goods and services. Capital formation in new construction is also estimated on the basis of the expenditure approach, whereas the commodity-flow approach is used to estimate investment of other capital goods. Private final consumption expenditure is estimated as a residual.

#### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

##### Gross domestic product by kind of economic activity

Agricultural census, 1965

Permanent agricultural surveys

Industrial census, 1967

Annual industrial statistics

Statistics obtained from building permits

Income-tax statistics

Accounting statements of enterprises

National employment surveys

Population and housing census, 1970

Government budgets and accounts

Continuous surveys of trade and services



## Cost structure of the gross domestic product

Government budgets and accounts

Balance-sheets of enterprises

## Expenditure on the gross domestic product

Government budgets and accounts

Balance-sheets of enterprises

Statistics obtained from building permits statistics

Balance-of-payments statements

## Methods and sources of estimation

Current prices

## Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

### Agriculture, hunting, forestry and fishing

In general, for the estimation of the gross value of agricultural production the physical quantities of production are considered, together with the respective wholesale or producers' prices. If these data are not available, an equivalent methodology is used. The estimates are made for such items as cereals, potatoes and other leguminous plants and crops cultivated principally for industrial use, etc., obtained from agricultural surveys and information furnished by some agro-industrial enterprises.

For the estimation of quantities of livestock production, the information on production and change in stocks published by the Oficina de Planificación Agrícola is used. In addition, information is taken from the Instituto Nacional de Estadísticas on livestock numbers, surveys of slaughterhouses and surveys of poultry. Information obtained from market auctions is also used.

The production of wine and chicha is estimated on the basis of information from the Servicio Agrícola Ganadero and the Dirección de Impuestos Internos. For fruit production, bench-mark data in terms of productive capacity in the country are available, and on the basis of figures referring to real property and plantations, annual estimates are made by different types of trees, distinguished by species and varieties. For the estimation of horticultural production data are obtained from the Instituto Nacional de Estadísticas and the Empresa de Comercio Agrícola on the production and sale of such crops.

Forestry production consists of a number of products, considered individually or with a certain degree of aggregation, but an additional item is included to cover a number of minor products which are difficult to quantify and are outside periodical control. Hunting for profit is one of the components of this item.

The surveys and estimations made for quantifying production include both marketed and non-marketed production. The use side of production is calculated on the basis of information on trade margins and additional estimates. Non-marketed production is treated as an input into agriculture or household consumption, depending on the use to which it is put.

The inputs into agriculture and forestry are generally estimated on the basis of information on production or sales provided by the suppliers of the various products. The principal items are seeds, manure, disinfectants, pesticides and veterinary products, fuels and lubricants, tyres, repairs of machinery and vehicles, electrical energy, forage, agricultural services and insurance.

For fishing, the basic information used to compile the production account is provided by the annual statistics of fisheries prepared by the División Pesca y Caza of the Servicio Agrícola Ganadero. From this source catches by species are obtained, values being expressed at shore prices. For the estimation of inputs, the structures of previous years are projected by adjusting for price changes. Separate estimates are made for industrial and individual fishing.

### Mining and quarrying

The estimation of gross value of production in this sector covers the following: coal, iron, copper, saltpetre and iodine, stone, clay and sand, and other mining. The estimates are based on data relating to sales and changes in stocks. There is a deviation from the standard method in the case of "other mining" and the stone, sand and clay subsector; for the former, the physical production of each product is valued by the average sales price, and for the latter it is based on expenditure data in the construction and industrial sectors, since production data are not available.

The production of coal is largely (95 per cent) centralized in one enterprise, the Empresa Nacional del Carbón, which supplies all the necessary information for the estimation of the production account. The case of iron is similar, since all the iron ore is produced by the Compañía de Acero del Pacífico.

Copper is subdivided into large, medium-sized and small copper mines. There is only one large copper enterprise, the Corporación del Cobre, which provides all the relevant information for the production accounts. For medium-sized mines, information is obtained at the company level, and for small mines the gross value of production is calculated on the basis of purchases of minerals, concentrates, etc. by the Empresa Nacional de Minería and inputs are calculated according to the cost structure survey conducted by that enterprise in 1968. The latter is updated by prices for each type of input.

The production of saltpetre and iodine is also carried out by a single firm, the Sociedad Química y Minera de Chile, which provides all the necessary information.

### Manufacturing

In estimating the gross value of production, the ISIC (Rev.1) classification system at the two-digit level is used for the industrial sectors, except for the basic metal industries, the refining of copper being classified, for the sake of

convenience, under the mining sector. For each of the industrial groups three different strata are distinguished, containing units employing 1-9 persons, 10-49 persons and 50 or more persons, respectively.

The basic statistics used for the first two strata are the annual statements made by industries to the industrial roll of the Dirección de Industrias y Comercio. For units employing 50 or more persons, the industrial yearbook of the Instituto Nacional de Estadística is used, which gives the gross value of production already calculated. In addition, for some groups that are largely concentrated in one or two enterprises, information is requested from the companies concerned, such as the Compañía de Tabacos, the Compañía Manufacturera de Papeles y Cartones, the Empresa Nacional del Petróleo and others.

With respect to the estimation of inputs, the same classification and sources are used as for the estimation of gross value of production. Intermediate consumption corresponds to the inputs actually used in the productive process.

#### Electricity, gas and water

For the principal enterprises producing electricity gross value of production and inputs are estimated from their accounting statements. For other enterprises, except own-use producers, the information is obtained from the Superintendencia de Servicios Electricos. In the case of own-use producers, statistics are taken from the Empresa Nacional de Electricidad and valued by average prices of the Sistema Interconectado, whereas their inputs are calculated through an updated input-structure.

For enterprises engaged in the production and distribution of gas, gross value of production and inputs are both estimated on the basis of information obtained directly from the enterprises. For water supply, data are obtained directly for the two most important enterprises, and the remaining enterprises are covered by supplementary statistics from which estimates of the gross value of production and inputs are prepared.

#### Construction

The gross value of production corresponding to construction by the public sector is obtained from the accounting registers of the institutions concerned.

For the private sector, construction expenditure on residential and non-residential buildings is calculated on the basis of municipal building permits. For each type of building the annual expenditure is estimated by applying a mathematical function to the values contained in these permits, adjusted for prices. The coefficients of this function indicate the gradual development of real expenditure throughout the construction period. The building permits also contain information on the number of dwellings, the number of rooms, surface area, the use of buildings, their age and other information.

In practice, however, building permits are not always obtained for rural constructions. In such cases an estimate is made for agricultural construction, including buildings and other construction, based on the agricultural censuses and information on credit granted to farmers for the construction in question.

Cost structures by type of construction are applied to the gross value of production of the public and private sectors, with the object of estimating intermediate consumption and the components of value added. Input price indexes are constructed to extrapolate the cost structure of the base year, primarily on the basis of statistics from the Instituto Nacional de Estadística and the Cámara Chilena de la Construcción. The value of repairs is estimated on the basis of the housing stock and its state, using the corresponding cost structure.

#### Wholesale and retail trade, restaurants and hotels

For the private sector, estimates are made separately for the wholesale and retail trades on the basis of a continuous survey conducted by the Instituto Nacional de Estadística. This sample survey covers a number of important commercial enterprises, classified by type of commerce, with annual information on sales, composition of costs, employment, etc. This information is supplemented by the accounting statements submitted by corporations and other sector indicators. In the absence of other information, the activity of travelling salesmen is estimated from the number of persons employed in this activity and their assumed average income.

The production accounts of public enterprises are prepared from information in their accounting statements or, failing that, from their budget statements.

The gross value of production of the trade sector is determined by aggregating the values of the mentioned subsectors and is also checked indirectly against the trade margins estimated in the input-output table.

Restaurants and hotels are included in community, social and personal services.

#### Transport, storage and communication

For railways, data from company accounts provide the necessary information. For private urban passenger transport, the basic information is derived from the number of issued tickets sold by the Banco del Estado to private collective transportation and the money obtained from such tickets, and supplemented by data of the state enterprise. The estimation of gross value of production and inputs is based on cost-structure data. For interurban passenger transport, the estimates are based on the stock of motorized vehicles. Information on cost structures is furnished by the Subsecretaría de Transporte, which helps to determine the components of value added and the basic inputs. For freight transport, the total number of lorries is obtained from the stock of motorized vehicles, adjusted to determine the number of lorries transporting freight. The cost structures are estimated by the Registro Nacional del Transportista and the Subsecretaría de Transporte.

For water transport, direct accounting information is available from the shipping enterprises and the port services, plus information provided by the Cámara Marítima and the Asociación Nacional de Armadores. Sufficient accounting information is available to construct a production account for air transport. Pipeline transport is covered by a large enterprise, which provides complete financial and statistical information. The estimates for services incidental to transport are based on information for some travel agencies, from which a cost structure is derived for the group as a whole. Storage is also covered in the estimates.

For public postal and telegraph services, accounting statements are available and data are also furnished by the major telephone company as well as by the other four enterprises.

#### Financing, insurance, real estate and business services

Using basic data from the Superintendencia de Bancos, profit-and-loss statements and other direct information it is possible to compile production and input estimates for banks, other financial institutions, financial corporations, real estate and insurance.

Bench-mark estimates for ownership of dwellings have been made on the basis of the housing censuses undertaken in 1960 and 1970, for actual rents paid and an imputation of owner-occupied dwelling rents. The total bench-mark value so obtained is projected annually by a value index, which combines the increase in physical stock (in square metres) with the consumer price index employed for the readjustment of rents. Repair estimates are obtained from the production account for construction and the amount of real-estate brokerage commissions, an estimate which affects the real-estate account. The estimation of gross value of production of real-estate brokers is made by extrapolating the previous year's production value by a weighted index based on real-estate taxes, while inputs are estimated on the basis of the figure for the previous year, the real value of production and changes in the wholesale price index.

Business services are included in community, social and personal services.

#### Community, social and personal services

For public administration and defence the budgets and accounts of the various government bodies provide the relevant basic data on a cash basis. The value added of public education is estimated on the basis of statistical information and accounting data for the whole sector. For private education, the estimates are based on aggregate indicators, distributed by using samples of cost structures, except in the case of the universities, for which complete information is available. For public health, complete information for the whole sector is available, permitting an adequate estimation of the different parameters. Private health services are estimated separately for clinics, independent professionals and others. Only partial direct information exists for these services, but it is supplemented by additional data on cost structure, number of visits, etc.

For other services, such as entertainment, barbers' shops and beauty salons, laundries, domestic services, etc., the estimates are made, when available, on the basis of balances and profit-and-loss statements, the ongoing survey of the Instituto Nacional de Estadística or such indicators as the rendering of services, average remuneration, employment, etc., from which an estimation can be made of the gross value of production, intermediate consumption and value added of each of these services.

For restaurants and hotels, the estimates are based on the ongoing survey of services conducted annually by the Instituto Nacional de Estadística. This information is supplemented by accounting statements of corporations, data for hotels received from HONSA, statistics on the number of guest-nights, statistics on hotel capacity provided by the Instituto Nacional de Estadística and information on employment in this sector.

## Expenditure on the gross domestic product

### Government final consumption expenditure

For estimating general government consumption expenditure, the government sector is subdivided into the central Government, the municipalities, decentralized institutions, the social insurance agency and public health and education institutions. Direct information is obtained from the Contraloría General de la República, the municipalities and the social insurance agency (Caja de Previsión). Because of the comprehensive nature of some of the figures, it is often necessary to make special inquiries and estimates to obtain the required details.

### Private final consumption expenditure

This item is estimated as a residual.

### Increase in stocks

Changes in stocks are estimated for finished goods and work in process for the agricultural, mining and industrial sectors. For imported intermediate goods, the change in stocks is calculated from actual data for crude petroleum and wheat, and for other goods the estimate is based on the moveable average method.

### Gross fixed capital formation

Estimates of gross domestic capital formation by type of capital goods are prepared by using the commodity-flow method. Data for locally produced capital goods in ex-factory values and imported capital goods in c.i.f. values are adjusted by change coefficients by type of capital goods to arrive at purchasers' values. The data on imported capital goods are obtained from the balance of payments. Gross fixed capital formation originating in the construction sector is estimated as explained above under "Construction". Investment in agriculture includes the development and extension of timber tracts, orchards and artificial pastures, and petroleum exploration is included in the mining sector.

### Exports and imports of goods and services

Estimates of exports and imports of goods and services are obtained from the balance-of-payments statements prepared by the Central Bank.

## Cost structure of the gross domestic product

### Compensation of employees

Wages and salaries are in most cases estimated from the balance-sheets of enterprises and/or direct information received from the enterprises. In cases where direct information is not available, this item is estimated by using figures for employment and average wages and salaries. Data on employers' contributions to social security schemes are obtained directly from the enterprises and are checked against government data. An imputation is also made for wages and salaries in kind.

### Operating surplus

Estimates of net interests and rents are obtained, in general, from the balance-sheets, etc. of the enterprises or, when this information is not available, from actual cost-structure data. The surplus is obtained as a residual.

### Consumption of fixed capital

Depreciation data are obtained from the accounting statements of the enterprises, which under the new legislation come fairly close to the concept of consumption of fixed capital at replacement cost. For some sectors for which direct information is not available, data on fixed assets by type of capital and their useful life are used. Charges for accidental damage are also included.

### Indirect taxes and subsidies

For indirect taxes, the fiscal statements published by the Tesorería General de la República are used, disaggregated by type of tax and allowing separate adjustments to be made.

Until 1976 the estimates of subsidies were based on fiscal statements published by the Dirección de Presupuestos. The use of subsidies has recently been reduced considerably, so that the estimates can now be obtained and identified from the relevant ministerial programmes.

## Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

Double deflation is used for agriculture, hunting and forestry; output is extrapolated by quantity indexes by product, whereas intermediate inputs are deflated by an index of input prices. Value added of fishing is extrapolated by quantity indexes of production.

#### Mining and quarrying

Value added is extrapolated by a quantity index of production.

#### Manufacturing

Value added is extrapolated by quantity indexes of production for industrial activities.

#### Electricity, gas and water

Value added of electricity, gas and water is extrapolated by the respective quantity indexes of production.

### Construction

Double deflation is used; current gross values of production are deflated by price indexes for each type of construction; for intermediate consumption, input-structures, with their respective prices, are used to obtain values at constant prices.

### Wholesale and retail trade, restaurants and hotels

Value added is extrapolated by a quantity index obtained on the basis of trade margins in the agriculture, fishing, mining and manufacturing sectors and imports.

### Transport, storage and communication

Double deflation is used; current outputs are deflated separately for different uses and types of transport, and the quantum indexes obtained are applied to the previous year's input values at constant prices.

### Financing, insurance, real estate and business services

Double deflation is used; for financial institutions, output is deflated by an implicit price index for expenditure and projected by the real increase of total deposits for the imputed service charge, and the resulting aggregated volume index is applied for input; for ownership of dwellings, output is extrapolated by an index based on the change in the housing stock, whereas inputs are deflated by the value index for repairs.

### Community, social and personal services

Double deflation is used; output is estimated by type of service by quantity indexes (for health, education and recreational services), deflated by adequate consumer price indexes for the remaining services, while volume indexes by type are used for inputs.

Double deflation is also used for restaurants and hotels; output is deflated by consumer price indexes for restaurants and hotels separately, checked by such information as number of guest-nights and number of beds, and the prices of the most important inputs are used to deflate the input values.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

The value added of government services is deflated by the index of the respective wage and salary rates, checking the results so obtained by the employment figures for this sector; purchases of goods and services are deflated by the wholesale price index and the price index of intermediate imported goods.

#### Private final consumption expenditure

Most domestically produced items are deflated by the appropriate components of the consumer price index. Imported goods are deflated by the price index of imported consumer goods.



### Increase in stocks

Changes in stocks of finished goods and work in progress in current values are deflated by subgroups of the wholesale price index, whereas imported products are deflated by the price index of imported intermediate goods.

### Gross fixed capital formation

For buildings and other construction, see the description provided under "Construction"; for transport equipment, machinery and equipment, the base-year estimates are extrapolated by a quantity index for each industrial group, except for imports, which are deflated by price indexes of imported capital goods.

## COLOMBIA

The presentation that follows is mainly based on information contained in two reports prepared by the Departamento Administrativo Nacional de Estadística in 1977: Cuentas Nacionales e Insumo-Producto and Análisis Preliminar de la Oferta Utilización de Bienes y Servicios a Disposición de la Economía Nacional durante el Período 1967-1969. Another source used is "Country practices in national accounting at constant prices" prepared by the United Nations Secretariat (E/CN.3/464).

### Introduction

#### History

Official national accounting work began in 1949 following the creation of a national income unit within the Department of Economic Research of the Banco de la República.

In 1960 the national income unit, with the assistance of a United Nations team, undertook a complete revision of the national accounts for the period 1950-1959.

Detailed information on the concepts, definitions, sources of basic statistics and methods of estimation used was published in 1963 in Conceptos, Definiciones y Metodología de las Cuentas Nacionales de Colombia, 1950-1961.

Since 1969 the national accounts series Cuentas Nacionales has been issued at approximately yearly intervals by the Banco de la República.

New revised series of national accounts were published in 1978 in Cuentas Nacionales de Colombia, 1970-1976.

#### Approaches used

##### Gross domestic product

Situation of the gross domestic product is mainly based on the production approach.

### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of almost all industries. The income approach is used to estimate the value added of producers of government services and some private services, and the expenditure approach is used for ownership of dwellings. The gross output of the trade sector is estimated by means of the commodity-flow approach.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, exports and imports of goods and services, part of the increase in stocks and gross fixed capital formation in construction. For other gross fixed capital formation, the commodity-flow approach is used, while private final consumption expenditure and part of increase in stocks are estimated as a residual.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

#### Gross domestic product by kind of economic activity

Agricultural sample surveys

Data from the Federación Nacional de Cafeteros

Censuses of mines

Manufacturing surveys

Data derived from building permits

Commercial census, 1967

Census of services, 1970

Information received directly from public enterprises

Government accounts

#### Cost structure of the gross domestic product

Various statistical surveys carried out in 1970

Government accounts

#### Expenditure on the gross domestic product

Government accounts

Manufacturing surveys

Commercial census, 1967

Family budget survey carried out in 1970

Foreign trade statistics

### Methods and sources of estimation

#### Current prices

#### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

#### Agriculture, hunting, forestry and fishing

The gross value of production in agriculture is obtained by multiplying the output of each commodity by the average price paid to producers. The price used in practice is the average wholesale price in the major producing areas, adjusted for transport and trade margins. Production and price data are derived from agricultural sample surveys, and from a variety of institutional sources, such as the Ministerio de Agricultura, the Caja de Crédito Agrario and the relevant trade associations. The Federación Nacional de Cafeteros supplies information on data for coffee, covering domestic consumption, exports and stocks of coffee. The value added of agriculture is obtained by deducting from the gross value of production the value of inputs as estimated by the Departamento de Planeación y Servicios Técnicos, using data on producers' costs and the flow of intermediate products into the sector. In the majority of cases the information available on production is furnished according to an annual period which differs from the calendar year.

In estimating the value added of the livestock sector, the production of each type of livestock is based on statistics of government-controlled slaughterings and net exports. Rough estimates are made for uncontrolled slaughterings, inventory changes and products other than livestock. The prices applied to the production data are prices quoted at livestock fairs throughout the country, adjusted for transport and trade margins. Input costs are obtained in much the same way as for the agricultural crop sector.

For forestry, fishing and hunting combined, information is available from INDERENA. In order to arrive at the value added, an arbitrary 10 per cent is deducted from the estimated total value of production.

#### Mining and quarrying

The mining sector covers the extraction of crude petroleum and natural gas, metallic and non-metallic mining and quarrying. Data for the petroleum industry are obtained directly from the oil companies operating in the country. Information on the output and value of metallic minerals is available from the censuses of mines and from institutional sources such as the Departamento Administrativo Nacional de Estadística and the Ministerio de Minas y Energía. The value of inputs

is obtained directly from the enterprises concerned in the case of iron-ore mining and on the basis of coefficients derived from the mining censuses in the case of other metals. A similar procedure is used for non-metallic minerals.

### Manufacturing

In this case information is derived from the manufacturing surveys of the Departamento Administrativo Nacional de Estadística. These estimates are projected, if necessary, by applying volume and price indexes to both output and input. The volume of raw materials consumed is assumed to move parallel to the volume of production. Estimates of inputs not covered by the surveys are derived from a study of the corporation accounts.

### Electricity, gas and water

In general, the basic data for the electricity, gas and water sector are obtained directly from the enterprises concerned. For electricity, surveys are carried out among the principal establishments to ascertain installed capacity, electricity generated, income and expenditure, etc. Various coefficients calculated from these data are used to estimate value added in plants not covered by the surveys. Own-account production estimates are also made.

Production estimates of water supply are obtained through a survey conducted by the Banco de la República and direct information from the public enterprises. Intermediate consumption is taken as 30 per cent of the total production value.

### Construction

In order to prepare the estimates for the construction sector, the Banco de la República has used indirect methods of estimation. For urban construction, the only source available is the number of building permits issued. Rough estimates are made for urban areas where no permits are issued, and a similar procedure is used for the other types of construction. For rural construction the estimates are based on an estimation of economic life of existing constructions and by using demographic data. The valuation is carried out through indirect methods, except in cases where indexes of construction costs are available.

For public works investment data obtained from the Government and the public enterprises are used.

### Wholesale and retail trade, restaurants and hotels

The value added of the trade sector is based on estimates of the flow of goods through trade channels. Each year's output of goods is analysed and classified in as fine product detail as possible and the appropriate trade margins calculated. The gross margins are calculated on the basis of sources furnished by the Banco de la República or recalculated from extracted indications in the commercial census of 1967. The mark-ups are kept constant over the period of analysis. Value added is derived by deducting an estimate of input costs based on an analysis of profit-and-loss statements of commercial firms.

Restaurants and hotels are included in community, social and personal services.

### Transport, storage and communication

For all the subgroups of transport the estimates are based on information provided by the Banco de la República. In the case of public enterprises the Bank uses sources that are directly available, in other cases surveys conducted by the Bank are used. Statistical information is also collected by the Departamento Administrativo Nacional de Estadística and refers basically to quantities, such as ton-kilometres and passenger-kilometres, the number of vehicles, etc. Data on values, however, have to be requested directly from the enterprises.

Basic data required to measure the contribution of the communication sector are generally obtained by direct inquiries.

### Financing, insurance, real estate and business services

Data for financial institutions, including insurance, are obtained directly from the enterprises concerned through the control exercised by the Superintendencia Bancaria. Estimates for ownership of dwellings are primarily calculated from the expenditure side.

Business services are included in community, social and personal services.

### Community, social and personal services

The contribution of the government sector is measured by the wages and salaries paid to employees of the central Government and the provincial and local governments and related government agencies. The data are obtained directly from the central government current expenditures presented by the Informe Financiero de la Contraloría General de la República and additional data issued by the División de Contabilidad y Estadística de la Dirección General de Impuestos Nacionales.

Value added of other private services is estimated by the Banco de la República on the basis of summary results from the census of services in 1970 and indirect methods. Constant input-output ratios have been assumed.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

Data on the current expenditure of the central Government and the provincial and local governments are available from official sources such as Informe Financiero de la Contraloría General de la República.

#### Private final consumption expenditure

Private consumption expenditure is usually estimated as a residual, since detailed data are not available for the purpose of estimating this item directly. Bench-mark estimates are obtained for the year 1970, however, on the basis of results from the family budget survey conducted that year.

#### Increase in stocks

The estimates for changes in stocks of primary goods and work in progress are based on information obtained directly from the results of the manufacturing

surveys. For processed goods, the estimates are based on figures from both the commercial census and the manufacturing surveys. For mineral products the change in stocks is obtained as the difference between production and other known uses. The estimates for livestock are those obtained in connexion with the estimation of value added for the livestock sector. Finally, the figures for coffee are estimated on the basis of data obtained from the Federación Nacional de Cafeteros, and the necessary co-ordination between production, domestic consumption and exports.

#### Gross fixed capital formation

Gross fixed capital formation is estimated by using the commodity-flow method. The c.i.f. values of imported capital goods in the foreign trade statistics are adjusted to include customs duties, other taxes and transport and insurance costs. Further adjustments are made for trade margins and installation costs on goods passing through trade channels. Estimates of the domestic production of capital goods are based on the manufacturing surveys.

Estimates of capital formation in construction are obtained as a by-product in the calculation of the construction sector's contribution to the gross domestic product. Investment in the government sector is estimated from the government accounts.

#### Exports and imports of goods and services

The estimates of exports and imports of goods are derived from the foreign trade statistics, properly adjusted. For services the estimates are derived from the balance of payments. Gold purchased by the Banco de la República from national producers is considered as exports and gold sold by the Bank for industrial uses as imports.

#### Cost structure of the gross domestic product

##### Compensation of employees

The estimates of compensation of employees are obtained in the process of estimating value added by industrial origin. For most sectors, estimates are based on statistical surveys carried out in 1970, and for other sectors they are obtained directly from accounting data. In the case of agriculture, hunting, forestry and fishing, the estimates are based on projections from census data on employment and statistics of average wages and salaries.

##### Operating surplus

Income from property and entrepreneurship is obtained as a residual, by deducting compensation of employees and net indirect taxes from the value added of each sector and total consumption of fixed capital from the gross operating surplus aggregate.

##### Consumption of fixed capital

Capital consumption is valued at replacement cost. Depreciation of buildings or other fixed assets owned by general government are not included in the estimates. No information is available on the sources and methods that are used to estimate the consumption of fixed capital.

## Indirect taxes and subsidies

No information is available on the sources and methods that are used to estimate indirect taxes and subsidies.

### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Value added of agriculture, forestry and fishing is extrapolated by a quantity index for output.

##### Mining and quarrying

Value added is extrapolated by a quantity index for output.

##### Manufacturing

Value added is extrapolated by a quantity index for output.

##### Electricity, gas and water

Value added is extrapolated by a quantity index for output.

##### Construction

Value added is extrapolated by a quantity index for output.

##### Wholesale and retail trade, restaurants and hotels

Value added of the trade sector is extrapolated by a quantity index of marketed supply of goods. No information is available for restaurants and hotels.

##### Transport, storage and communication

Value added is extrapolated by a quantity index of services rendered, extrapolated by quantity indicators for estimating the value added of communication at constant prices.

##### Financing, insurance, real estate and business services

For financial institutions and insurance, value added is extrapolated by a quantity index of output. The value added of ownership of dwellings is deflated by an index of rents.

##### Community, social and personal services

No single typical approach is used for all components; for public education and domestic services, value added is extrapolated by the number of persons

employed; for entertainment, value added is extrapolated by the number of spectators. For producers of government services, value added is deflated by an index of wages and salaries.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

Wages and salaries are deflated by an index of wage and salary rates, purchases of goods and services being deflated by a specially constructed price index.

##### Private final consumption expenditure

Private final consumption expenditure at constant prices is obtained as a residual.

##### Increase in stocks

No specific information is available.

##### Gross fixed capital formation

For buildings and other construction, the current values are deflated by a producer price index. For domestically produced transport equipment, machinery and equipment, the current values are deflated by appropriate indexes of producer prices, and in the case of imported capital goods extrapolated by a quantum index for imports.

##### Exports and imports of goods and services

No specific information is available.

#### CYPRUS

The presentation that follows is mainly based on information prepared for the Interregional Seminar on the Revised System of National Accounts, Caracas in December 1975 and the study entitled History and Analysis of the Methodology of National Accounts in Cyprus, published by the Statistics and Research Department, Ministry of Finance at Nicosia in October 1977. Supplementary information was received from this Department in November 1977.

#### Introduction

##### History

The first official attempt to estimate the national income of Cyprus was made in 1950, following the recommendations of the first Conference of Colonial Government Statisticians, and was mainly based on the census of employment and production held in 1950/51 and the 1950 census of agriculture.



The first annual estimates of national income were made by the Statistics Section of the Financial Secretary's Office in 1955 and published in the Economic Review. Since 1959, with the establishment of the Republic of Cyprus, the publication of this report was undertaken by the Statistics and Research Department of the Ministry of Finance, and replaced by the Economic Report from 1963 onwards.

The first national accounts estimates at constant prices, based on the former SNA were adopted in the Economic Review of 1958, choosing 1950 as the base year.

In 1973 the national accounting system was put on a new basis, with significant changes in the methodology followed. Much of the new system was based on the present SNA, and it is hoped to apply this system fully in the years to come.

#### Approaches used

##### Gross domestic product

As a general rule the production approach is used to estimate the gross domestic product.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries. The income approach is used for part of the transport sector, community services, and part of the social and personal services. The commodity-flow approach is used in the case of wholesale and retail trade.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, and exports and imports of goods and services. The commodity-flow approach is used for estimating gross capital formation in combination with the expenditure approach. Private final consumption expenditure is mainly estimated by the commodity-flow approach.

#### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

##### Gross domestic product by kind of economic activity

Agricultural sample surveys

Census of industrial production, 1972

Annual industrial production surveys

Construction surveys

Annual services surveys

Government accounts and returns

## Cost structure of the gross domestic product

Government accounts

Annual industrial production surveys

## Expenditure on the gross domestic product

Government accounts

Annual industrial production surveys

Agricultural sample surveys

Foreign trade statistics

## Methods and sources of estimation

Current prices

## Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

### Agriculture, hunting, forestry and fishing

The collection of data on crop production has been conducted by means of area sample surveys based on the frame provided by cadastral maps. From 1969 to 1974, the area sample survey was conducted twice a year, but since 1975 a new system of data collection has been introduced, involving the establishment of a frame of agricultural holders, the selection of a stratified random sample of 1,600 holders, and the use of questionnaires completed by enumerators of the Department of Statistics. The farmers are interviewed, and the questionnaire relates to data on area planted by crop, volume of production, employment, capital formation, current operating expenses and family livestock. Apart from the sample survey on crops, a sample survey is conducted (starting in 1975), which covers greenhouse production. The allocation of inputs to each separate output category is difficult and is done on a proportional basis.

Following the 1969 census of animals, sample surveys conducted twice a year have been introduced in order to collect current data on livestock. Separate samples are taken for each type of animal, i.e., stratified random samples based on the frame provided by the various censuses of animals conducted in recent years (1973-1975). Apart from these sample surveys, livestock statistics are also collected through questionnaires completed monthly by the town and village authorities; the data supplied relate to the number of animals slaughtered at each slaughterhouse in the country. The value added of the agriculture sector also includes value added originating in agricultural services.

The output of hunting, trapping and propagation is estimated as the value of game felled by all hunters, since the figures compiled cover hunting and trapping of all kinds.

For forestry and logging, the output consists of receipts from the sale of trees, timber and other forest products as well as the cost of felling and transport, and is calculated for both the government and private sectors.

Data on output of fishing, consisting of the value of the fish caught and sponges collected, are supplied by the Fisheries Department. Value added is the excess of gross output over intermediate inputs plus net indirect taxes.

#### Mining and quarrying

The estimation of the contribution of mining and quarrying to gross domestic product is based on annual inquiries held in conjunction with the annual industrial production surveys and the censuses of industrial production that are conducted every five years. These inquiries cover all mining companies and a sample (10 per cent) of quarries selected from the Register of Establishments held by the Department of Statistics and Research and brought up-to-date in collaboration with the Mines Department. Primary data on quarrying are also provided by the Mines Department. Through these inquiries, data are obtained on gross output at ex-factory prices, inputs at delivered prices, expenditure on fixed capital formation, employment, earnings and production in physical terms.

#### Manufacturing

The data for the estimation of the manufacturing sector are derived from the annual industrial production surveys and the censuses of industrial production held every five years. The censuses, which are preceded by the registration of establishments, cover all establishments employing five persons or more and a sample of 5 per cent of those employing from one to four persons. Data are collected on employment, earnings, output and sales in physical as well as monetary terms, detailed breakdown of inputs, capital formation, stocks, mechanization and capacity utilization.

Since 1974, the annual industrial production survey has included all establishments employing five or more persons and a subsample of small establishments. Through the annual surveys, data are collected on gross output and inputs used in production.

The latest census of industrial production used in the estimation was held in 1972.

#### Electricity, gas and water

The data used are derived from the annual industrial production surveys and the censuses of industrial production held every five years. Gross output of electricity is estimated by multiplying the quantity sold by the average selling prices. In computing the value added, the value of non-industrial services is subtracted from the census value added; this proportion is taken from the census of industrial production and is reviewed every five years. Until 1971 the data on gas obtained from the petroleum companies related only to bottling and distribution. Since 1972 gas has also been produced, but the output is classified under petroleum refining.

The output figures for water supply refer to the activities of the four largest municipalities; the value added of water supply activities in the villages

is included in the public sector. Data for the estimation of gross output and value added are derived from the annual industrial production surveys, which extend to all establishments in this sector.

### Construction

For the public sector, data are extracted from financial reports or balance-sheets, copies of which are received by the Department of Statistics and Research on an annual basis. The reports contain detailed information on the type of activity and amount of investment during the year under review.

In the case of the private sector, the basic data are collected through construction surveys, using as a frame building permits with complete coverage. Such surveys are usually carried out every three years. For repairs and maintenance, for which no building permits are required, the amount of construction work done is estimated on the basis of the rental value of the premises. The results extracted from the construction surveys are supplemented by data derived from ad hoc inquiries on intermediate inputs, permitting a detailed breakdown of construction output into its various components.

### Wholesale and retail trade, restaurants and hotels

The commodity-flow approach is used for the estimation of value added of the trade sector. Gross trade margins are generated by the following economic activities - local agricultural production, local mining and industrial production, exports, imports and re-exports. The trade margins are, in general, based on research results in 1966. Wages, salaries and rents of the Cyprus Grain Commission (a public enterprise) are added, as well as an amount corresponding to the price subsidy paid by the Government to the Commission. In order to arrive at the value added, 20 per cent is subtracted, representing inputs and indirect taxes, as revealed by the investigation carried out in 1966.

Restaurants and hotels are included in community, social and personal services.

### Transport, storage and communication

For bus passenger transport, the bench-mark estimate of 1967 is extrapolated by the indexes of the number of buses in use and the bus fares. For taxi-cab operation, the bench-marks are made by multiplying the number of vehicles in circulation by the daily earnings per vehicle and are then multiplied by the number of working days; intermediate expenses are deducted to arrive at value added. For other years the index of vehicles in circulation is used to extrapolate the base-year value added, and the price index of taxi-cab fares is used to convert it into current prices. A similar method is used in the case of supporting services to land transport.

On the basis of research done in 1966/67, quantity transport margins per unit were established for each kind of commodity marketed through the wholesale and retail trade. These transport margins, revised from time to time, are used to estimate total gross output of lorry transport. Value added is estimated at 70 per cent of the total gross output after deducting packing materials costs and porters' and port workers' wages. For extrapolation, a combined weighted index for agriculture, mining and quarrying, manufacturing, imports and exports is used, the weights being each sector's current gross output at constant prices. For porters

and port workers, value added is based on a combined quantity index of agriculture, mining and quarrying, manufacturing, imports and exports, converted into current terms by adjusting for the change in wage rates for porters.

Value added of postal and port services and civil aviation is equal to personal emoluments, cost-of-living allowance and casual assistance, as extracted from the Financial Report of the Government Treasury. Value added generated by Cyprus Airways and the Cyprus Telecommunications Authority consists of wages and salaries, rents, profits and capital consumption allowances, which are regularly obtained from the above organizations.

#### Financing, insurance, real estate and business services

Data on financial institutions are collected by the Central Bank of Cyprus which supervises and controls the operations of commercial and savings banks. Similar data are also collected for other financial institutions through a variety of methods. Data on insurance activity are extracted from the records of the Office of the Supervisor of Insurance Companies, which is responsible for the operation of insurance companies in Cyprus. The estimation of value added in real estate other than ownership of dwellings is related to the trend in the above two activities and to land and buildings transfer fees.

The rental value of residential buildings is estimated on the basis of the total dwelling stock and prevailing rents. The total number of dwellings is arrived at by adding the net annual increase in the construction of new dwellings to the latest census figures. The annual average rent per dwelling is estimated on the basis of the rent index of the retail price index. Cost of repairs and maintenance and related taxes imposed by the central Government, municipalities and improvement boards are deducted in order to arrive at value added.

#### Community, social and personal services

For public administration and defence and other government services the Financial Report published annually by the Treasury and the annual returns submitted by the local authorities to the Department of Statistics and Research constitute the sources from which value added is compiled. Value added is largely composed of compensation of civilian employees, and the National Guard's wages and payments in kind and rents, paid and imputed. For the Cyprus Broadcasting Corporation and local government services which are included here, the Department of Statistics and Research receives information through suitable questionnaires sent to the Cyprus Broadcasting Corporation and all municipalities and improvement boards on an annual basis.

The main source of information for the private services is the services survey prepared each year by the Statistics and Research Department. This source provides data on gross operating margins and the number of persons employed for all categories of services, separately for sanitary and similar services, social and related community services, recreational and cultural services, and personal and household services. Both business services and restaurants and hotels are included in this major division of economic activity.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Central government consumption expenditure is estimated from the details of actual expenditure published in the Accountant-General's Financial Report. The transactions in that report are recorded on a calendar-year basis and are presented in a detailed manner. Totals of transactions falling under each category of exclusion are made for use in the appropriate national accounts estimates. From the remaining transactions of expenditure given in the report, proceeds from sales of goods and services to enterprises and households are deducted, and imputed rent of government buildings is added in order to arrive at central government consumption expenditure.

Local government consumption expenditure covers the consumption expenditure of the municipalities and the improvement boards, the sources of which are the final accounts of all town municipalities submitted through the Auditor-General to the Statistics and Research Department. Information about the remaining local authorities is extracted from the questionnaires posted to the above authorities.

Semi-government consumption expenditure is the expenditure of organizations such as the Cyprus Broadcasting Corporation etc. Information for the above organizations is derived from annual postal questionnaires.

### Private final consumption expenditure

Since 1966, private final consumption expenditure and its composition have been estimated on the basis of the commodity-flow approach. The sources used are annual agricultural surveys, annual industrial production surveys, annual services surveys, annual exports and imports data, and annual financial reports from the Treasury Department. Besides the above-mentioned sources, household expenditure surveys are conducted from time to time by the Statistics and Research Department on a sample basis, whereby useful information can be obtained for the improvement and correction of the whole method.

For multi-use commodities the method used to estimate the proportion of each use is given in a 1966 report entitled The Contribution of Wholesale and Retail Trade.

Private consumption expenditure on services is estimated from a variety of sources, inter alia the results of the services survey carried out annually by the Statistics and Research Department, and information from the household expenditure surveys. The financial report of the Treasury Department supplies information on radio and television licences etc.

### Increase in stocks

This is an item for which the estimate is poor, at least for some sectors. Changes in animal numbers are obtained from the agricultural surveys, and data are available on wheat and barley stocks held by the Grain Commission. Estimates on changes in stocks held in the trade sector are interpolated from certain 1963 data; estimates of changes in stocks held in mining, manufacturing and electricity, gas and water are based on annual industrial surveys and annual reports of the mining companies.

### Gross fixed capital formation

Gross fixed capital formation is estimated by user and not by owner sector, as recommended in the United Nations system. Since 1972 the estimates have been made by sector and type of capital asset. Data on fixed capital formation in mining and quarrying, manufacturing, electricity, gas and water are obtained through the censuses of industrial production conducted every five years and the annual industrial production surveys. A special capital formation survey in the manufacturing sector was undertaken in 1971, based on a follow-up of the realized import licences for plant and machinery. Mark-ups were established and applied in later years to the cost-insurance freight (c.i.f.) values stated on the import licences of machinery and equipment. For electricity generation and water supply, data are also obtained from the Electricity Authority of Cyprus and local authorities, respectively. Data on public administration investments are available in the Financial Report, published by the Government Treasury.

The main sources of information for the estimation of fixed capital formation in the other sectors are data on imports for domestic use, the publication Imports and Exports, the local industrial production of capital goods as reported in the industrial production surveys, and figures received from several organizations (for the estimation of motor cars etc.). In this context the commodity-flow approach is widely used, supplemented by recent direct inquiries such as the six-monthly agricultural area sample survey, which not only covers machinery and equipment, but also provides figures on construction, including own-account construction.

For construction, the basic data are collected through construction surveys, usually carried out every three years, using as a frame the building permits.

### Exports and imports of goods and services

Data on exports and imports of goods and services are obtained from the balance-of-payments statement prepared by the Central Bank of Cyprus.

### Cost structure of the gross domestic product

#### Compensation of employees

So far, it has not been possible to segregate compensation of employees from operating surplus. For some sectors such as mining and quarrying, manufacturing and electricity, data on compensation of employees are collected regularly, but for other sectors such as wholesale and retail trade and transport, no information beyond total value added is known because of the method adopted (the commodity-flow method). For the agricultural sector a great difficulty exists in distributing the income among the aggregates of compensation of employees and operating surplus.

#### Operating surplus

(See under "Compensation of employees" above.)

#### Consumption of fixed capital

The estimate of fixed capital consumption in Cyprus is based on a fixed percentage of the gross national product (4.5 per cent). No attempt is made to estimate capital consumption by kind of economic activity, owing to the lack of data on capital stock.

## Indirect taxes and subsidies

All the data about indirect taxes and subsidies are available in the Financial Report, an annual publication of the Treasury Department in the Ministry of Finance.

### Constant prices

## Gross domestic product by kind of economic activity

### Agriculture, hunting, forestry and fishing

Double deflation is used; for crop and livestock production and fishing, output is revalued at base-year prices at the individual item level, whereas output for forestry and hunting is deflated by a price index of government timber, respective price index of cartridges; for input of agriculture both extrapolation and deflation methods are used, e.g. feeds, seeds, fertilizers etc. are revalued at base-year prices, whereas current input for forestry is deflated by the index of transport costs (per cubic foot) and for fishing by a price index of fuel.

### Mining and quarrying

Value added is extrapolated by a quantity index for output, based on data in physical terms collected in connexion with the annual industrial production surveys.

### Manufacturing

Value added is extrapolated by using the index of annual industrial production, based on physical quantities of individual commodities produced; for repair of motor vehicles etc., employment and total revenue adjusted for price changes have been used as indicators.

### Electricity, gas and water

Output of electricity is computed at constant prices by valuing the sales of electricity in quantitative terms at base-year average prices, with fixed value added ratio. For gas, value added is calculated by valuing the output of the current period at average selling prices of each firm in the base-year. The production of water in physical units is expressed at base-year prices and constant value added ratio applied.

### Construction

Value added is extrapolated by three deflated components of construction gross output (dwellings, non-residential buildings and other construction), with the price indexes of main inputs, including labour input, used as deflators.

### Wholesale and retail trade, restaurants and hotels

Value added of the trade sector is deflated by the retail price and the wholesale price indexes for the consumer goods and the intermediate goods, respectively. For the Cyprus Grain Commission, wages and salaries are extrapolated by an employment index, and rents are deflated by a rents index from the retail



price index, while current quantities of subsidized items are multiplied by base-year prices. For restaurants and hotels, value added is extrapolated by the use of employment indexes.

#### Transport, storage and communication

Value added of the various components is extrapolated by a quantity index for output, such as the index for buses in use (urban, suburban, interurban and other transport), the index for vehicles in circulation (other passenger land transport), a combined index for agriculture, mining and quarrying, manufacturing, imports and exports (lorry transport, porters and port workers), and an index of employment with adjustments for productivity changes (communication and air transport), with a quantity index of passenger-miles to include gross profits in the latter case.

#### Financing, insurance, real estate and business services

Value added of banking is extrapolated by a volume index compiled by deflating wages and salaries by an index of the average rates of pay. Value added of insurance is partly deflated by a constructed service charge index and partly deflated by the wholesale price index. Current value added of real estate is deflated by the implicit deflator for banking and insurance, whereas the rent index of the retail price index is used to deflate value added of ownership of dwellings.

#### Community, social and personal services

For public administration, compensation of employees is extrapolated by using a weighted index of employment; the National Guard's wages are deflated by an index of the National Guard's wage rates, and its payments in kind are deflated by the appropriate group index of the retail price index, rents deflated by the rent index of the retail price index, whereas intermediate inputs are deflated by the rent-excluded retail price index.

Value added at constant prices for other services (in both the government and the private sector) is estimated basically by the use of employment indexes. The index of rents is used in cases where rent is a component of value added.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

Compensation of employees is estimated at constant prices by using a weighted index of employment to extrapolate the base-year figure. Payments in kind to the National Guard, and rents, are deflated by the appropriate group index of the retail price index, and purchases of goods and services are deflated by the retail price index (rents excluded).

##### Private final consumption expenditure

Private consumption expenditure at constant prices is normally estimated as a residual. However, when detailed data become available, the value of each expenditure item is deflated by the partial index of the consumer price index. In cases where such a partial price deflator is not available, use is made of the partial price index of a related item or the total consumer price index.

### Increase in stocks

Price deflation is used to estimate the increase in stocks at constant prices.

### Gross fixed capital formation

For construction, the current estimates are deflated by the combined weighted indexes of labour and materials, for agricultural machinery they are deflated by the selling price index of the "average" tractor, for other machinery and equipment they are deflated by the combined weighted average index of the agricultural machinery price index and the motor-vehicles price index, and for transport equipment, they are deflated by an average weighted index based on prices for each type of capital motor vehicles.

### Exports and imports of goods and services

The export price index is used to deflate exports and re-exports of merchandise, freight and insurance and other transportation. The retail price index is used to deflate the remaining components of exports of goods and services (i.e., travel, government not elsewhere indicated, and other services).

The import price index is used to deflate all the components of imports of goods and services.

## DENMARK

The presentation that follows is mainly based on information prepared by the Statistical Office of the European Communities in 1976 in an annex report entitled "Base statistics needed for the ESA accounts and tables: present situation and prospects for improvements". Other sources used include Input-output tabeller for Danmark 1966, 1/ the report on country practices in national accounting at constant prices, issued by the United Nations Secretariat (E/CN.3/464) and the revised annex thereto (ST/ESA/STAT.79). Supplementary information was received from Danmarks Statistik in June 1978.

### Introduction

#### History

The first official national accounts estimates for Denmark were published by the Statistical Department in 1948 in the study Nationalproduktet og Nationalindkomsten, 1930-46.

Historical series of national accounts estimates were published in 1958, in Studier over Danmarks Nationalprodukt, 1870-1950, by K. Bjerke and N. Ussing. These estimates relied on production statistics going back to 1870, except for the

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1/ Input-output Tabeller for Danmark 1966, vols. I and II, Statistiske undersøgelser, Nos. 30 and 31 (Copenhagen, Danmarks Statistik, 1973).

estimates of the non-agricultural sectors for the period 1870-1915, which were based on income statistics.

The first estimates in accordance with the present United Nations System of National Accounts were published in 1970 by Danmarks Statistik, in Statistiske Efterretninger.

In 1973 a new detailed input-output table was prepared and published in Input-output Tabeller for Danmark 1966. 1/

#### Approaches used

##### Gross domestic product

The main approach used to estimate the gross domestic product is the production approach.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of almost all industries. The income approach is used to estimate the value added of producers of government services and parts of business services and other private services. The gross output of wholesale and retail trade is primarily estimated by means of the commodity-flow approach.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, increase in stocks, and exports and imports of goods and services. The commodity-flow approach is extensively used for private final consumption expenditure and gross fixed capital formation, supplemented somewhat by the expenditure approach.

#### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

##### Gross domestic product by kind of economic activity

Annual agricultural statistics

Annual surveys of industrial enterprises

Annual surveys of construction

Mark-up data from the Price Directorate

Transport enterprise accounts

Government accounts

Value-added tax statistics

## Cost structure of the gross domestic product

Annual surveys of industrial enterprises

Government accounts

## Expenditure on the gross domestic product

Government accounts

Turnover statistics

Inventory statistics

Investment surveys of certain purchaser branches

Foreign trade statistics

## Methods and sources of estimation

Current prices

## Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

### Agriculture, hunting, forestry and fishing

The estimates of agricultural production are based on product-by-product data in terms of volume and prices. The estimates of gross output can be supplemented by survey data on total costs and cost structure. This survey only covers a sample of the agricultural holdings, and the data provided relate to the profit and loss accounts. Additional information is supplied by agricultural consultants for a certain proportion of the agricultural holdings.

The values, volume and prices of the various agricultural products are taken from the annual agricultural statistics, on which their allocation by use is also partly based. For the estimation of fur farming, the main source is the annual report of the Danish Fur Farming Association.

For forestry, the annual agricultural statistics provide the main statistical source, but accounting data on private forests furnished by the Danish Forest Association are also used.

For fishing the main sources used are the annual reports of the Ministry of Fisheries. The production values of the marine fisheries reported are used directly, whereas most cost estimates are based on accounting data.

### Mining and quarrying

This sector is of minor importance in Denmark; the statistical sources are the same as for manufacturing.

## Manufacturing

The estimates are based on several sources. An annual survey covering all enterprises employing 20 or more persons (before 1973, the criterion was six or more persons) provides data that are available after approximately 12 months on total turnover, total intermediate consumption, wages and salaries, and stocks at the beginning and end of the period. Another source is a quarterly survey on the turnover of 4,000 products (value and volume), which also forms the basis for the estimates given in the lines of the input-output table. These figures are available after five months and cover enterprises employing six or more persons. Censuses taken in 1966 and 1975 provide a product-by-product breakdown of intermediate inputs.

The value-added tax returns of enterprises are an important general source. This information, to which the Danish Statistical Office has access, is used in particular to make estimates for small enterprises and services not covered by direct surveys. Invoiced value-added tax is used, since value-added tax on purchases includes both current transactions and purchases of capital goods. The value-added tax data are available on a quarterly basis.

Of the establishments classified under manufacturing in the value-added tax statistics those covered by the annual survey of manufacturing industries are singled out. The remaining establishments are regarded as small-scale manufacturing units, and their sales data according to the value-added tax statistics are used for national accounting purposes.

## Electricity, gas and water

Gross output and intermediate consumption for electricity production are estimated mainly from annual electricity statistics, whereas the annual accounting statistics of the municipalities are the main source for gas production. For water supply, the estimates are based on local government reports on the accounts of the enterprises concerned and other annual data.

## Construction

This branch is covered by a survey similar to the one for manufacturing (turnover, intermediate inputs etc.), but the breakdown is not as detailed. This annual accounting survey has been in existence since 1966, covering some areas of private construction. Another important source is investment statistics showing quantitative data available on building starts, works under construction and works completed. Construction in the public sector is estimated from government accounts.

## Wholesale and retail trade, restaurants and hotels

Two different methods are used to calculate gross trade and transport margins. One, the direct method, is based on accounting data from a sample survey of wholesale and retail trade enterprises, but these data have to be adjusted for under-coverage, mark-ups on trading activity by the manufacturing industry and other non-available margins. The second, indirect, method is based on the commodity-flow approach. For each commodity, estimates are made of the size of the gross margins of wholesale and retail trade, respectively, and of the shares of each commodity passing through each link in the distributive chain. These estimates are partly based on information from the Price Directorate, specified for

each commodity-user flow. In principle, the indirect estimates of gross margins are preferred to the direct ones. Cost ratios used for the estimation of intermediate consumption are based on information from the accounting statistics of wholesale and retail trade, respectively.

For restaurants and hotels the estimates are mainly based on value-added tax statistics and hotel statistics with information on the number of guest-nights.

#### Transport, storage and communication

For railways, ports, airports, urban transport, post and telecommunication, the information is taken from the accounts of the enterprises concerned. For road transport, data are obtained from value-added tax returns and combined with those taken from the lorry fleet. A survey similar to the one for manufacturing (turnover, intermediate inputs etc.) is carried out for the shipping industry; the information is much weaker, however, for the coasting trade.

#### Financing, insurance, real estate and business services

In accordance with legal obligations currently in force, banks and insurance companies must submit their balance-sheets and complete accounts of their current transactions to an audit board. The Danish Statistical Office thus has access to reliable information for the estimation of value added of financial institutions.

For housing rents, a bench-mark survey is carried out every five years as part of the population census. For intervening years, changes in the average rent and total stock of residential buildings are known. Rents of rented dwellings are used for the imputation of rents of owner-occupied dwellings. For years in which housing censuses are taken, the level of rents in the rented dwelling-stock is applied to owner-occupied dwellings, both categories being grouped by age, quality and geographic location. For intercensus years the development is decided by the number of owner-occupied dwellings and by the index for rents in the rented dwelling-stock, for which the basic data are collected twice a year for the calculation of the consumer price index.

For business services the value-added tax statistics are the main statistical source, but information from the population census and accounting data of advertising services are also used. For lawyers and auditors, the estimates are based on the number of professionals and their assumed average incomes.

#### Community, social and personal services

The main sources for the producers of government services are the accounts of the central Government, local governments and social security funds.

For other market services there is no general survey as there is for the industrial sectors, construction, commerce and shipping. Audience figures and revenue data are available for theatres and cinemas. Some areas of personal services are covered by value-added tax statistics; the liberal professions are not liable to the tax and therefore their production estimate cannot be based on this source; social security data are used instead for doctors, dentists etc. For private education, the estimates are primarily based on percentages of government grants, and a number of different methods are used for the contribution of medical and health institutions.

## Expenditure on the gross domestic product

### Government final consumption expenditure

The accounts of the central Government, local governments and social security funds are the main information source for general government. The data are available in a form that makes them difficult to analyse, as the accounts are not harmonized and the breakdown of expenditure by type is inadequate. A new standardized accounting system is currently being prepared; it has already been introduced for local governments and it is planned to start using the system for the central Government in 1979. A new survey on employment in general government agencies is also in progress. The estimates refer to fiscal years at present, but calendar years will be used in general government accounts from 1978.

### Private final consumption expenditure

In order to record household consumption expenditure, product balances are drawn up using the commodity-flow method. This method gives results with a time-lag of two years. For short-term estimates, turnover statistics for the retail trade are used. Family budget surveys have only been carried out at intervals of about five years, and refer to employees' households only (self-employed persons and non-active persons are, however, included in the 1976 survey). Final consumption of households also includes the collective consumption of private non-profit institutions.

### Increase in stocks

The total amount of change in stocks is estimated on the basis of inventory statistics. For stocks in manufacturing, wholesale and retail trade, the inventory statistics are collected in terms of values as part of the accounting statistics in these fields. Various assumptions about the valuation principle, rate of turnover, etc. have to be made in calculating the stock changes.

### Gross fixed capital formation

The commodity-flow method is used to estimate gross fixed capital formation. Director surveys of purchaser branches are incomplete, so gross fixed capital formation is primarily given by product, and the breakdown by ownership branch is only partially provided. The valuation is made net of deductible value added tax.

The estimates on buildings are based partly on quantitative data available on construction starts, work under construction and work completed, and partly on information obtained from accounting data. The latter category includes construction for the central Government and local governments, government enterprises and agriculture (accounting data from a sample of agricultural holdings). Work in progress on dwellings for which a buyer has not yet been found is included in gross fixed capital formation.

The estimation of gross fixed capital formation in machinery, transport equipment and other equipment is based on production and foreign trade statistics, supplemented by some capital expenditure information for certain activities. In order to arrive at the proper valuation, gross margins etc. are added to the production and import values. The gross margins are, as far as possible, based on information from the Price Directorate.

## Exports and imports of goods and services

Exports and imports of goods and services are estimated mainly from the balance-of-payments and foreign trade statistics. Special surveys are available for shipping, on the basis of the shipping companies' reports, and for payments to and receipts from the rest of the world by Danish enterprises.

The basic sources for balance-of-payments data are the external payments reported to the central banks and the statements of external assets and liabilities made by Danish enterprises to the Danish Statistical Office.

## Cost structure of the gross domestic product

### Compensation of employees

Data on the compensation of employees are taken directly from the annual surveys on current transactions for the branches covered by these surveys. At present, employers' actual social contributions are not given by branch, but only as a total figure.

### Operating surplus

Operating surplus is estimated as a residual.

### Consumption of fixed capital

At present only rough estimates are included for the consumption of fixed capital in the Danish national accounts computations.

### Indirect taxes and subsidies

Total indirect taxes and subsidies are available from government accounts. For taxes linked to production and imports, the breakdown by branch is carried out on the basis of the type of tax. As far as the value-added tax is concerned, there is a single rate, with few activities excepted, which makes it relatively easy to draw up the accounts for the input-output table. The net value-added tax system is applied both to value added at market prices and gross fixed capital formation. Operating subsidies are broken down by branch according to the branches receiving such subsidies.

## Constant prices

## Gross domestic product by kind of economic activity

The revised national accounts data are deflated by means of a price index (mainly producers' prices, with 1970 = 100) related to each of about 4,000 groups of goods and services included in the commodity flows of the national accounts system. The price indexes are applied to domestic output as well as imports, and the procedure used implies that gross domestic product by kind of economic activity is subject to double deflation.



## Expenditure on the gross domestic product

In general, the price indexes arrived at for the supply of goods and services, broken down into some 4,000 groups, are assumed to be relevant also to the categories of use of these groups, except that for the deflation of exports the indexes for domestic output are used exclusively. To the extent that separate price indexes are available for categories of use, for instance private consumption expenditure, they are used to control the deflation results.

### DOMINICAN REPUBLIC

The presentation that follows is mainly based on the detailed information on sources and methods of estimation contained in the series Cuentas Nacionales, Producto Nacional Bruto, published by the Banco Central de la República Dominicana, the latest issue of which came out in November 1977, covering the period 1970-1976. Supplementary information was received from the Banco Central in March 1978.

## Introduction

### History

In 1966 the Banco Central de la República Dominicana published Cuentas Nacionales de la República Dominicana, Producto Bruto Nacional 1950-1964.

The national income group in 1970 published revised figures for the national accounts covering the period 1960-1968.

The first issue of a comprehensive national accounts publication, Cuentas Nacionales, Producto Nacional Bruto 1960-1971, was published in 1973 by the National Accounts Unit of the Department of Economic Studies of the Banco Central.

### Approaches used

#### Gross domestic product

Generally the production approach is used to estimate the gross domestic product.

#### Gross domestic product by kind of economic activity

The production approach is the basic method of estimation used for most sectors. The income approach is used for trade, transport and communication, finance, general government and other services. The characteristics, quantity and quality of the basic statistics are the major considerations influencing the choice of approach in individual cases.

#### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, increase in stocks, and exports and imports of goods and services.

Gross fixed capital formation is to a large extent estimated by the commodity-flow approach, while private final consumption expenditure is taken as a residual. This residual also includes changes in stocks that could not be computed directly.

#### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

##### Gross domestic product by kind of economic activity

- Agricultural production statistics
- Annual industrial statistics
- Government accounts
- Trade census, 1955
- Population censuses
- Transport surveys and accounting data
- Accounting data of financial institutions

##### Cost structure of the gross domestic product

- Government reports and accounts

##### Expenditure on the gross domestic product

- Government accounts
- Balance-of-payments data

#### Methods and sources of estimation

##### Current prices

##### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

##### Agriculture, hunting, forestry and fishing

In agriculture, gross output is estimated by multiplying the quantities harvested by the average price paid to the producers. The output figures refer to crop years; where crop year and calendar year do not coincide, crops are attributed to the year in which they are harvested. The basic data available for quantities harvested are the permanent production series issued by the National Statistical Office (discontinued in 1962), the data from the agricultural censuses of 1950, 1960 and 1970, estimates by the United States Agency for International Development,

the Banco Agrícola, the Ministry of Agriculture and others. Adjustments are made to the original output data from analyses of family expenditure surveys. Own-account consumption is also included in the production series. Price information for rice is obtained from the Banco Agrícola, which used to supervise the marketing of rice, and from the Internal Revenue Service, which formerly levied a tax on the husking of rice. In the case of sugar-cane, use is made of data sent directly to the National Statistical Office by the sugar mills on quantities of cane cut and processed. For tobacco, very comprehensive information is available from the Tobacco Institute at Santiago.

There is no systematic statistical recording of agricultural prices at the farm level. A compilation is made of all existing series of wholesale prices, retail prices, export prices and prices of agricultural raw materials for industrial use. In addition, a study relating to the major products is used to determine prices paid to producers in the base-year 1962. The inputs taken into account are seeds, fuel and lubricants, packing materials, fertilizers and insecticides.

Various sources are used to estimate gross output of livestock production. Data on the volume of livestock production are provided by the Agricultural Planning Unit of the Ministry of Agriculture, which has also undertaken investigations to quantify the unreported slaughter of livestock and herd changes by the use of certain rates. The final estimate is prepared by adding the volume of slaughtered livestock and herd changes. Milk production is estimated on the basis of a household sample survey of consumption in 1973 and current data from the principal producers. Poultry and egg production is estimated on the basis of per capita consumption estimates, but is checked against census information and estimates by agricultural experts.

For cattle, pigs and goats, the prices paid to producers in 1962 by Ganadera Industrial Dominicana are taken as the basis for extrapolating the figures, and using retail prices of the various kinds of fresh meat. The same method is also used to obtain price series for milk, poultry and eggs. The following inputs are estimated: feed, packing materials, and veterinary pharmaceutical products. Services rendered to the livestock industry are not estimated owing to lack of information. Otherwise, agricultural services are calculated in an implicit manner.

For forestry and logging, the volume of firewood production is estimated from industrial fuel consumption data, to which an estimate of the average consumption of rural families is added. Production is valued at prices paid to producers per metric ton of firewood used in industry. The basic data concerning charcoal production are provided by the National Statistical Office. An approximate percentage is used to represent inputs. Value added of hunting is not estimated because its contribution is insignificant.

For fishing, information on the volume of catch is obtained from the Hunting and Fisheries Division of the Ministry of Agriculture. In calculating the value of fisheries production, the landed price per ton of fish in 1962 is used, extrapolated by the cost-of-living price indexes for fresh fish. For input it is necessary to resort to an approximate percentage based on data for other countries in the area whose fishing practices are similar to those of the Dominican Republic.

## Mining and quarrying

The basic information for calculating gross output is obtained directly from the reports on production and sales of enterprises, which cover more than 80 per cent of the production of minerals in the country. This information is checked against other information at the National Statistical Office (the annual industrial bulletins). It is not possible to prepare estimates for the quarrying of sand owing to lack of information.

## Manufacturing

The most important source on which the estimates of manufacturing are based is the series of annual bulletins of industrial statistics. The bulletins do not provide information on the value of annual output, but this can be calculated, since the bulletins provide data on quantity produced, quantity sold and value of sales for each commodity. There are no significant changes in stocks that might have affected the results because of the valuation of output at average prices of stocks built up from preceding years. The data on manufacturing production are classified by the three-digit level of industry and the four-digit level of commodity group, and total output is arrived at by simple aggregation. Adjustments are made in order to cover the production of fresh meat in slaughterhouses and to complete the coverage of coffee-mills.

In calculating inputs, four aggregates are used: raw materials, fuel, packing materials and other minor inputs, computed at the four-digit level of ISIC. Unpublished information on raw materials used, by sector, at the four-digit level is available from the National Statistical Office. With regard to fuel and packing materials, detailed annual information is available from the same Office. In order to estimate other inputs, use is made of coefficients obtained from a sample of balance-sheets of industrial establishments for the period 1960-1963.

It has been possible to estimate value added of craft industries from output data derived from the bulletins referred to above, valued by price series obtained from surveys among producers.

## Electricity, gas and water

This sector is almost entirely covered by the Dominican Electricity Corporation, from which detailed data are available, thus making it possible to estimate value added by both the production and the income approach. For a few municipal plants, however, only gross operating income figures are available, and inputs are estimated from data on operating costs for plants belonging to the Dominican Electricity Corporation.

## Construction

This sector's contribution to the gross domestic product is obtained by applying to the gross output of private and public construction a coefficient representing the ratio of gross factor income.

In order to estimate gross output, an annual index of construction costs is constructed on the basis of the main domestic and imported materials used and the wage rates for this type of activity. The value of public construction is compiled from central government data, annual reports of the Ministry of Finance,

municipalities data, annual bulletins on municipal finance, and direct data provided by decentralized institutions and public enterprises. The value of the total output of the sector is arrived at by adding the value of public construction to the value of private construction. From 1961 onwards, as the building permit series became invalid, the value of private construction has been calculated as a residual. The total value of construction for 1960 taken as a bench-mark is extrapolated by means of a value index, which is obtained by constructing an index of the main materials used in construction and combining it with the price index mentioned above.

The percentage of value added per peso of construction value, used as a fixed coefficient, is estimated by data obtained from the National Housing Institute, the Ministry of Public Works and private construction enterprises.

The estimates mentioned above do not include the value of rural construction from such materials as shingles, palm planks etc. An additional estimation has to be made for such housing units, based on the number of buildings of this kind reported in the housing censuses with series including net increases and replacements. The valuation of this series is based on information gathered from users in certain rural area.

#### Wholesale and retail trade, restaurants and hotels

Data for the trade sector are available from the first national trade census carried out in 1955, and from total wholesale and retail sales figures published periodically by the National Statistical Office. The income approach is applied in the estimation. Wages and salaries are calculated by combining average remuneration series with sectoral employment series. The average annual remuneration is obtained by extrapolating the 1955 figure by a special index. Employment in the sector is estimated on the basis of the 1955 census and the population censuses. Rents paid are estimated from the 1955 trade census, extrapolated by means of a rent index and the number of wholesale and retail establishments. Interest and commissions are estimated for the period as a proportion of total wholesale and retail sales, according to the 1955 ratio. A special study has been made of balance-sheets that commercial firms submit to the income tax authorities. From this sample study it has been possible to estimate profit percentages on sales, including tax and depreciation, broken down by period and wholesale and retail categories. These coefficients are applied to the corresponding annual sales values.

Restaurants and hotels are included among other services (community, social and personal services).

#### Transport, storage and communication

With regard to the shipping and air transport subsectors, the Dominican merchant marine and the Dominican airline provide the accounting data needed to estimate incomes, inputs and value added.

The information obtained on land transport includes data from transport enterprises and surveys among owners of lorries and taxi-cabs. Private road freight companies provide data on annual income and inputs per lorry; these data are combined with the number of vehicles used on account of others, estimated as a percentage of the total number of lorries licensed each year. Estimates of

taxi-cabs are based on the data available on licensing, income, operating costs, fares and days worked per year. In the case of urban buses, data on fares, the number of buses in service, the average daily number of passengers carried, and inputs are obtained from the Municipal Supervisory Office for the National District. The information on shipping and air transport is supplemented by data on the factor income of foreign shipping and airline agencies (local offices).

Simultaneous use is made of the production approach and the income approach in the case of communication, as a great deal of information is provided by both public and private enterprises.

#### Financing, insurance, real estate and business services

For financial institutions, the estimates are based on complete accounting information, which is available for all banks and finance companies and most insurance companies.

The value added of ownership of dwellings is estimated by deducting from the value of the gross rents paid or imputed the amount of the inputs for maintenance, upkeep and management, and property taxes. The value of the gross rents paid or imputed is determined from census data on the number of housing units existing in 1950, 1955 and 1960, classified as urban and rural, by main type of construction materials used. For other years the number of housing units is estimated by taking the census data as bench-marks and applying information from the calculation of private construction. The valuation of owner-occupied housing is based on average rents for similar houses.

Business services are included in community, social and personal services.

#### Community, social and personal services

For public administration and defence, the basic data for the central Government are obtained from the National Budget Office, and for municipalities from the National Statistical Office's annual publication Municipal Finance, supplemented and adjusted for some years by information obtained directly from the Municipal Office for the National District and the Dominican Municipal League. A large number of independent institutions supply detailed information on income and expenditure to make it possible to prepare the requisite estimates.

For other private services detailed calculations cannot be made on the basis of the information available. An approximate method is therefore used; the number of persons employed is determined from population census data and to this a mean income is applied, based on average salary data for the sector in 1960. The bench-mark data are extrapolated according to changes in an income index specially constructed for this purpose.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

For the central Government, basic information is obtained from the Ministry of Finance and the National Budget Office; for independent institutions it is obtained directly from the institutions involved and, in the case of the municipalities, from the National Statistical Office's bulletin Municipal Finance.

### Private final consumption expenditure

This item is calculated as a residual, representing the difference between the gross domestic product and the other components of final expenditure. Included in the estimate are changes in stocks that could not be computed and accumulated errors.

### Increase in stocks

The estimates cover stocks in the mining and manufacturing sectors in addition to peanut, raw tobacco and beans. Changes in stocks in the mining and manufacturing sectors are the result of the difference between production and sales for the year. For other products, the estimates are derived as commodity residuals.

### Gross fixed capital formation

The estimation of private and public construction is already explained under "Construction" above. The value of machinery, equipment and transport and communication equipment is estimated by the commodity-flow method. All such capital goods are assumed to be imported, since none of them is produced locally at the present time. The basic tabulations of imports are analysed in order to compile the data on imports of capital goods in f.o.b. values, later converted to c.i.f. values through the application of ratios furnished by the External Sector Unit of the Banco Central. Customs duties and surcharges are then added and, in order to include trade mark-ups, a survey has been made among local distributors and importers to determine mark-ups and commissions charged to the public and private sectors. To complete the valuation of capital goods at prices paid by the users, installation and starting-up costs are added if applicable.

### Exports and imports of goods and services

The data on exports and imports of goods and services are taken from the publication on balance of payments, prepared by the External Sector Unit of the Banco Central.

### Cost structure of the gross domestic product

#### Compensation of employees

This item is not estimated separately. Instead, gross domestic product at factor cost is obtained by deducting indirect taxes net of subsidies from gross domestic product at market prices.

#### Operating surplus

See above.

#### Consumption of fixed capital

See above.

## Indirect taxes and subsidies

Data on indirect taxes and subsidies are compiled from the annual reports of the Ministry of Finance and information supplied directly by the Treasury and the National Budget Office. The subsidies consist mainly of government grants to producers, but deficits reported by State enterprises are also included.

## Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

For agriculture value added is estimated by a revaluation at base-year prices of the quantities of each product harvested. In the case of livestock products, annual changes in average meat yield per animal can be measured precisely. For forestry and fishing, a revaluation of quantity data at base-year prices is also carried out.

#### Mining and quarrying

Value added is estimated by a revaluation of the different mineral quantities at their respective 1962 prices.

#### Manufacturing

Value added is extrapolated by quantity index of output, based on quantities produced and prepared for the various levels of classification. A special index for craft industries is prepared by revaluing output quantities for each year according to the National Statistical Office's data at estimated 1962 prices.

#### Electricity, gas and water

Value added is extrapolated by quantity index of output, based on the series of kilowatt-hours sold by the Dominican Electricity Corporation and by municipalities.

#### Construction

Value added of both public and private construction is deflated by means of index of construction costs. For certain rural dwellings, the value at constant prices is estimated by multiplying the number of houses built annually by their estimated 1962 values.

#### Wholesale and retail trade, restaurants and hotels

For the trade sector in general, wholesale and retail sales of locally produced and imported goods are deflated by means of the respective price indexes. In the case of export trade, the volume of each product exported is multiplied by the gross mark-up for each product in the base-year.



### Transport, storage and communication

Value added is extrapolated by quantity index of output; for trucks and lorries the quantity index is based on total volume of transportable goods; for taxi-cabs it is based on the number of vehicle licences and the number of actual working days, for urban buses on the number of vehicle licences in the National District, for air transport on the number of passengers carried, for shipping and related services on the annual volume of freight carried and personnel employed in the Dominican merchant marine, and for communication on the number of telephones installed, the number of messages received and the personnel employed.

### Financing, insurance, real estate and business services

For financial institutions, value added is extrapolated by quantity indicators of personnel employed in banks, insurance companies and financial companies. For ownership of dwellings, the indicator used is the number of urban and rural dwellings.

### Community, social and personal services

For public administration and defence, value added is extrapolated by an indicator of the number of personnel employed in central Government, municipalities and independent institutions. Employment data are also used to extrapolate value added of other services.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

Price deflation is used; compensation of employees is deflated by means of the cost-of-living index, whereas government purchases and sales are deflated by means of general price indexes considered to be representative of the changes in prices of such goods and services.

#### Private final consumption expenditure

As in the case of estimates at current prices, this item is obtained as a residual.

#### Increase in stocks

Production and sales figures are obtained at constant prices through the use of price data; the resulting difference is the change in stocks at constant prices. The same procedure is followed for agricultural products.

#### Gross fixed capital formation

The value of construction is deflated by a construction-cost index. For rural dwellings, the constant-price values are determined by multiplying the number of houses built annually by their estimated 1962 values. For other fixed assets the value at prices paid by the user in the base-year is extrapolated by indexes of physical volume, specially worked out for each of the groups into which imports of these goods are subdivided.

## Exports and imports of goods and services

Because of the type of calculation used for profits from trade, the balance of payments is expressed at constant prices by using the import price index as a deflator.

### EGYPT

The presentation that follows is mainly based on a memorandum received from the Central Agency for Public Mobilization and Statistics in June 1978 on Egypt's national accounting practices and notes concerning SNA review discussions that took place in Egypt in October 1977.

## Introduction

### History

The first attempts to estimate the national income were made by some foreign experts for the years 1932, 1933 and 1934. Individual estimates were later prepared by Egyptian statisticians, mostly based on the production and income approaches.

The expenditure approach was used by Dr. Mahmoud Amin Anis in 1950 in estimating the national income for the period 1937 to 1945, published in A Study of the National Income of Egypt, 1950.

The first official national income estimates relating to the year 1948 were published in 1952 by the Department of Statistics and Census.

The Ministry of Finance and National Economy in 1955 put the Department of Statistics in charge of the evaluation of national income for the years 1950-1954. The first official estimates were calculated using the income and production approaches.

The Secretariat of the National Planning Committee (now the Ministry of Planning) was in charge of annual estimates of national accounts from 1959, which were used as bench-marks for the pre-plan year. The present series of national accounts for Egypt are based on the original data published by this Ministry in its annual Implementation and Evaluation Annual Reports.

The Central Agency for Public Mobilization and Statistics is now largely responsible for the preparation of national accounts series based on actual data at the beginning of 1970 in line with the new SNA, later developed into a complete input-output table for the year 1966/67.

### Approaches used

#### Gross domestic product

The main approach used to estimate the gross domestic product is the production approach.

### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries. The income approach is used to estimate the value added of community, social and personal services, and some other industries.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, private final consumption expenditure, increase in stocks, gross fixed capital formation, and exports and imports of goods and services.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

#### Gross domestic product by kind of economic activity

Annual statistics of cultivated areas, livestock and co-operative agricultural activities

Agricultural data supplied by the Ministry of Agriculture

Industrial production censuses

Annual industrial statistics

Construction and building statistics

Commercial censuses

Annual sample surveys of retail trade

Statistics of wholesale trade

Transport statistics

Financial statistics of banks, insurance companies and organized private sector companies

Government accounts

Family budget sample surveys

Labour force sample surveys

#### Cost structure of the gross domestic product

Government accounts

## Expenditure on the gross domestic product

Government accounts

Annual inventory statistics

Family budget sample surveys

Building and housing censuses

Population censuses

Foreign trade statistics

Balance-of-payments data

## Methods and sources of estimation

Current prices

## Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

### Agriculture, hunting, forestry and fishing

The Ministry of Agriculture collects data from farmers on crop area, yield and crop-cutting through annual sample surveys. Livestock numbers and figures for livestock products are obtained from special censuses carried out every two years. Prices received by farmers are collected annually during the three months following the harvest of each crop. All these data are sent to the Central Agency for Public Mobilization and Statistics to be used in estimating the production account of agriculture.

The estimated acreage of each of the main crops, the fruit crops and the vegetable crops, is multiplied by the average productivity of the basic area of measurement. The gross output is evaluated at farm-gate prices. These estimates take into account non-marketed production for own consumption and own use.

The estimates of intermediate consumption are based on data collected from co-operative societies on the supply of seeds, fertilizers, etc., and also the results of agricultural censuses, which provide cost-structure coefficients.

The gross output of agricultural services is estimated on the basis of information furnished by co-operative societies and units serving agriculture or derived from censuses, indicators thus being obtained of the relationship between the gross output of agricultural services and the output of agriculture proper. The gross output of livestock and fishing is estimated on the basis of data available.

### Mining and quarrying

See below under "Manufacturing".

## Manufacturing

In the industrial sphere, annual basic statistics on industrial production, capital formation, employment, wages and salaries, etc. are available for industrial establishments employing 10 or more workers. These industrial economic units form the organized sector of the economy. A large number of industrial establishments with less than 10 workers form the non-organized sector, for which no accounting system is available. Some attempt is made to estimate the transactions of these small establishments by using data from industrial censuses of mining and manufacturing, and some other industrial information on statistical parameters and economic indicators and studying the cost structure of each industry, productivity, the degree of mechanization, etc.

### Electricity, gas and water

See above under "Manufacturing".

## Construction

Indirect estimates of the output of construction from the input side are made by means of employment data, data on intermediate consumption such as cement, bricks, timber and other commodities and service inputs. By using the relationship between available data on intermediate consumption and primary inputs in organized enterprises and applying the previous relation for the estimated intermediate consumption of this industry, the value of gross output and the components of value added are obtained. According to this method, the residual value represents building and dwellings undertaken by the small contractors or by households themselves.

## Wholesale and retail trade, restaurants and hotels

The annual basic statistics provide a comprehensive coverage for wholesale trade; in the retail trade, establishments with five or more workers are covered. The data collected include detailed information for the compilation of economic tables and national accounts. For retail trade establishments with less than five workers the sources are sample surveys conducted every three years. Some indicators are used for the annual estimates of gross trade margins, inputs, wages and salaries, etc.

Estimates for restaurants are made by using data derived from a general enumeration of establishments, statistics on wages and working hours, surveys of the labour force, besides other data collected on output, input, etc. by a small sample survey. Data for hotels are covered by annual questionnaires which supply all the necessary information.

## Transport, storage and communication

Data on the output, inputs and other elements of large-scale transport establishments are often available from annual accounts, which contain data for the compilation of production, income and outlay and financial accounts. Because the sources of actual data are scarce for unorganized transport activity, their estimates are based on information on the number of establishments, the number of workers, wages and salaries and other statistical sources. Indicators for various

types of transport, including input-ratios, are used to estimate value added, and some studies have been carried out to estimate the elements of the remaining economic accounts.

#### Financing, insurance, real estate and business services

With respect to public financial institutions and insurance companies, gross output and inputs are usually estimated on the basis of data collected annually from these financial units. Data on the basis of which imputed service charges may be estimated are also, in general, available from these sources.

For real estate and business services, data on paid as well as imputed rents of owner-occupied dwellings are based on family budget surveys. For other private building, rent estimates depend on the information on average rents and the number of dwellings available in the housing censuses. Other subactivities of real estate and business services are estimated by using available data.

#### Community, social and personal services

The government accounts are comprehensive and detailed enough to permit the compilation of government economic tables and accounts. Annual data for all non-profit institutions serving households are available and permit the compilation of tables and accounts.

The service activities of unincorporated enterprises are in no better a position for estimation than the other activities of the private sector; economic and financial data are lacking, especially for personal services. By using censuses of establishments, wage and salary statistics or other available statistics, annual estimates of their gross output, inputs, etc. are calculated. Some data are available for establishments engaged in education, research, medical, recreational and cultural services. Workers engaged outdoors in handicrafts and workers in the retail and transportation sectors, etc. are also included in the estimates.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

The estimates are based on government budgets and accounts for all levels of government. Before using this information, the items shown in the budgets and accounts are reclassified according to the commodity and service groups adopted for the table on uses and resources. A cross-classification of transactions by function and economic category is available for the government accounts. Whenever final accounts are not available and budgets have to be used as a substitute, certain adjustments are made to the budgetary figures on the basis of previous experience.

##### Private final consumption expenditure

The estimates are based on family budgets and household expenditure surveys.

### Increase in stocks

The Department of Statistics prepares in some detail data on inventories of cotton covering both commercial stocks and stocks of the spinning industry. The other main source of information is data collected regularly by the Ministry of Supply on changes in inventories of certain products of high priority and strategic materials. On the basis of this information, an evaluation of the total increase in inventories has been attempted. Information is lacking, however, on a great number of products.

### Gross fixed capital formation

Government capital formation is estimated directly, together with the government consumption expenditure. Private capital formation is obtained by deducting this estimate from an estimate of total capital formation.

Capital formation in construction and public works is arrived at as described under "Construction" above. Capital formation in machinery and equipment is estimated by using the commodity-flow approach. Statistics on domestic production, imports and exports of capital goods are analysed in detail in order to determine the final use of the various items. Commodities that may also be used for purposes other than capital formation are sometimes split after thorough studies based on the experience of technicians or on the basis of more or less arbitrary hypotheses.

### Exports and imports of goods and services

Estimates of exports and imports of merchandise are generally based on foreign trade statistics. Usually when the balance-of-payments statements are prepared, all the data on income transfers, other current transfers and capital financial transactions with the rest of the world are available.

### Cost structure of the gross domestic product

#### Compensation of employees

See above under "Gross domestic product by kind of economic activity" for information on the methods and sources of estimation.

#### Operating surplus

No specific information is available on sources and methods. A gross estimate is made, i.e., including consumption of fixed capital.

#### Consumption of fixed capital

See above.

#### Indirect taxes and subsidies

Indirect taxes and subsidies are recorded separately for all economic units in the compulsory standard accounts for public enterprises and the economic surveys for the private sector. As far as the coverage of subsidies is concerned, losses of all government enterprises and corporations are treated as negative operating surplus.

## Constant prices

### Gross domestic product by kind of economic activity

Gross domestic product by kind of economic activity at constant prices is estimated by the Central Agency for Public Mobilization and Statistics on the basis of official index numbers of prices, quantities, etc., for example, wholesale prices, farm prices, consumer prices, prices of imported merchandise, prices of exported merchandise, quantities of agricultural output, quantities of agricultural intermediate consumption, quantities of imported merchandise, quantities of exported merchandise, value added of agriculture at current and constant prices, industrial production values at constant prices, employment and wages, values of imported merchandise and values of exported merchandise.

### Expenditure on the gross domestic product

The expenditure side of the gross domestic product is also estimated at constant prices. For general information on sources and methods used in this estimation, see under "Gross domestic product by kind of economic activity".

## EL SALVADOR

The presentation that follows is mainly based on the comprehensive information on methodology contained in Metodología de Cuentas Nacionales de los Países Centroamericanos, published by the Consejo Monetario Centroamericano, Secretaría Ejecutiva, in October 1976, and information received from the Banco Central de Reserva de El Salvador in May 1978.

### Introduction

#### History

The first effort to estimate national product or income for El Salvador was made in 1946 by H. C. Wallich and J. H. Adler.

In 1957 the Economic Commission for Latin America undertook a study of El Salvador's economic development, in which it published statistical series of the national product for the years 1950 to 1957.

In 1960, the estimation of national product was taken over by the Departamento de Investigaciones Económicas del Banco Central. Once the basic methodology had been established, production and expenditure accounts were estimated at current prices for the years 1958-1963.

The estimation methods were revised in 1964 in order to achieve greater reliability. The results were subject to further refinement in 1967, and presented in the document Cuentas Nacionales de El Salvador - Resultados y Métodos de las Cuentas de Producto y Gasta para los Años de 1958 a 1968.



## Approaches used

### Gross domestic product

The main approach used to estimate the gross domestic product is the production approach.

### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries. The income approach is used in the case of domestic services and public administration and defence, while an indirect method is used for the trade sector.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, increase in stocks, and exports and imports of goods and services. The commodity-flow approach is mainly used for the estimation of private final consumption expenditure and gross fixed capital formation, but is in both cases supplemented by the expenditure approach.

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Agricultural data from government agencies

Industries censuses

Annual industrial surveys

Annual statistics of electricity enterprises

Data on public construction

Data from construction permits

Censuses of commerce and services

Annual surveys of purchases, inventories and sales of the trade sector

Financial statements of autonomous institutions

Annual surveys of passenger and goods transport

Financial statements of the national financial system

Annual surveys of private education centres

Annual surveys of professional services, recreation and amusement

External trade statistics

Government accounts

Population censuses

Cost structure of the gross domestic product

Government accounts

Expenditure on the gross domestic product

Government accounts

Annual surveys of inventories

Balance-of-payments data

External trade statistics

Methods and sources of estimation

Current prices

Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

Agriculture, hunting, forestry and fishing

The agricultural data are mainly provided by the Ministerio de Agricultura y Ganadería, and are obtained by means of three types of periodic survey, the survey on quantity objects, the survey on multiple purposes and special surveys. The figures referring to the coffee harvest are supplied by the Compañía Salvadoreña de Café, while the corresponding prices are taken from the export prices of the Compañía de Café. For cotton production, information from the Cooperativa Algodonera Salvadoreña Ltda. is used, based on monthly deliveries from co-operative producers. When direct information is not available, data on consumption, external trade or industry are consulted.

The gross value of production is calculated by use, and generally by applying producers' prices to the quantity of each commodity produced. The prices are obtained from different sources, usually from producers and agricultural associations or from studies by the Ministerio de Agricultura y Ganadería and the Banco Central de Reserva. Estimates prepared by the Departamento de Promoción Agropecuaria e Industrial of the Banco Central de Reserva are used for inputs.

For the livestock sector, information is obtained from the Dirección General de Estadística y Censos, including external trade data and using prices obtained twice a month from direct studies (or consumer-based prices). Inputs are estimated

on the basis of apparent consumption. For poultry, the production estimates are based on consumption data from rural and urban household surveys. The agricultural census of 1961 has also been used for bench-marks.

The estimates for agricultural services are made indirectly. Services related to the harvesting, husking, etc. of coffee are estimated, and also the cost of anti-pest spraying by planes belonging to the producer. The cost of supplies of agricultural equipment and operating services is taken from agricultural survey data by the corresponding government agency. Estimates of hunting are not computed.

The value added of forestry and logging is also estimated by means of indirect estimation methods. The production of firewood for household consumption is estimated separately for urban and rural areas; for urban areas it is estimated as a difference after determining the number of households that use other types of fuel, for rural areas it is estimated by multiplying the annual average consumption by the number of rural households. The industrial use of firewood is estimated for bakeries, salt-makers, small industrial establishments and those with more than five employees, and is based on the index of apparent consumption of maize, results from the annual surveys of the Dirección General de Estadística y Censos or as a fixed percentage of total firewood consumption. Logging activity is not highly developed, and production is estimated as a percentage of firewood production.

For fishing, production is calculated mainly for fish and shrimps caught in the high seas. The production for export is valued at prices supplied by the Ministerio de Economía, while the rest is valued at producers' (company) prices. An additional 10 per cent takes account for coastal fishing.

#### Mining and quarrying

For estimating the production of limestone, sulphate, sand, gravel and clay, an indirect method is used, based on 1961 census figures and a volume index constructed from square-metre construction data. The result so obtained is multiplied by a price index of construction materials to arrive at the gross value of production. Intermediate consumption is estimated as a percentage of the gross value of production. For salt production, the data are provided by the Dirección General de Estadística y Censos.

#### Manufacturing

The gross value of production in manufacturing is based on the results of the industrial censuses and annual surveys conducted by the Dirección General de Estadística y Censos. The censuses are normally held every five years, starting in 1952. The establishment is used as the statistical unit of observation in both the censuses and the surveys. For intermediate consumption, the estimates of raw materials by subbranch is, in principle, taken from the annual surveys. The other inputs are determined only for industrial branches; thus data on electrical energy from the Inspección General de Servicios Eléctricos are distributed by branch in accordance with the structure indicated in the annual surveys, data on the consumption of fuels are distributed by applying ratios from latest census, and similar methods are used for transport services and packing materials.

The artisan sector is estimated from consumption data and direct studies. Small-scale manufacturing is otherwise covered by an extrapolation of census data, and by using production coefficients applied to the total of raw materials required for the branch in question.

## Electricity, gas and water

The estimates for electricity are made on the basis of information furnished by the Inspección General de Servicios Eléctricos, the Comisión Ejecutivo Hidroeléctrica del Río Limpá and the Compañía de Alumbrado Eléctrico de San Salvador. Input costs are calculated both from data furnished by these agencies and from industrial census results. Information on the different consumers of electricity is also available. Census data also form the basis on which the value added of gas production is determined.

Financial statements referring to water supply and sanitary services are obtained directly from the Administración Nacional de Acueductos y Alcantarillados.

## Construction

For private construction the information is obtained from the Dirección General de Estadística y Censos, adjusted by population data and by indirect methods. Information for the public sector is obtained from all corresponding institutions, including autonomous institutions for which annual statements are available. The basic sources for private urban construction are the number of construction permits issued, and corresponding information obtained separately for new construction, enlargements, repairs, urbanization, etc. The estimates for rural construction are based on rural population figures in order to determine the number of new dwellings, and are valued using a method designed by the Ministerio de Planificación.

Intermediate consumption for both private and public construction is determined by using a fixed percentage of the gross value of production, based on a study conducted by the Departamento de Investigaciones Económicas.

## Wholesale and retail trade, restaurants and hotels

The gross output of the trade sector is determined on the basis of values of the domestic and imported goods marketed. The gross value of production for domestic goods is adjusted for changes in stocks at the level of both producers and distributors, and then trade margins are added. For imported goods the c.i.f. value is adjusted for changes in stocks at the distributor level, using trade margins provided by the Dirección General de Estadística y Censos. From the total gross value of production an estimate for inputs made from survey-based percentages for electricity, transport, etc. is deducted in order to arrive at the value added. Bench-marks from the five-yearly censuses of commerce and services are used for checking purposes.

For restaurants and hotels the estimates are interpolated and extrapolated on the basis of census figures, which also determine the input-structures.

## Transport, storage and communication

For railways, direct information is available for the two enterprises operating in the country. The Dirección General de Estadística y Censos is the basic source for estimating road transport services, providing a list of enterprises classified into international, interdepartmental, urban and interurban transport. A sample of each category is taken so as to obtain average figures for estimating receipts per ton, which are multiplied by quantity figures to arrive at

the gross value of production and later value added. A similar method is used for passenger road transport, determining total transport capacity, to which average receipts by location are applied, to arrive at the gross value of production; value added is arrived at by using a fixed proportion of the former for inputs. Taxi services are estimated by multiplying the number of taxi-cabs registered by the average receipts per taxi-cab, obtained directly from a sample of enterprises. There too, inputs are a fixed percentage of the gross value of production. For air transport, the information used to estimate the gross value of production, inputs and value added is received directly from the air transport companies. Direct information is also obtained for port services. Storage is estimated on the basis of data provided by the Banco Hipotecario.

For communication, information is obtained directly from the Administración Nacional de Telecomunicaciones and the Dirección General de Correos, thus making it possible to estimate the gross output and the value of inputs.

#### Financing, insurance, real estate and business services

Value added, gross output and intermediate consumption in banking and insurance are estimated on the basis of financial statements furnished directly by the banks and insurance companies to the Banco Central. Imputation is made for service charges by deducting deposit interest from investment income. Financial statements are also provided for other financial institutions.

In estimating the contribution of ownership of dwellings to the gross domestic product, both actual rents paid and imputed rents of owner-occupied dwellings are taken into account. The estimates are based on the number of urban and rural dwellings, obtained from the population censuses and rents data obtained from surveys, using the cost-of-living index as an inflator. Inputs are adjusted for by deducting 10 per cent of the gross value of production.

For business services only legal services are estimated separately, based on the number of practising lawyers and using previously determined data for both gross output and intermediate consumption. The other business services are considered to be included in the information for other sectors, i.e., accounting services of trade are included in the gross trade margins, auditing services of financial institutions are incorporated in their financial statements, and other services are considered on a user basis.

#### Community, social and business services

Government services are estimated on the basis of constitutional information published by the Ministerio de Hacienda and more detailed statistics provided by the same ministry. For local governments, monthly information on income and expenditure is available, and information is also obtained from the Carta de Cuentas de la República and from the Tesorería General de Fondos Específicos Municipales. For autonomous institutions, the estimates are based on annual financial statements to the Banco Central, supplemented by information from the central Government and local governments.

Private educational services are estimated on the basis of a survey of educational institutions conducted by the Ministerio de Educación, to which is added information from the Universidad Católica. These two sources provide complete information for estimating value added and intermediate consumption. The

value of services rendered by private hospitals and clinics is estimated on the basis of profit-and-loss statements from the majority of these institutions. In the case of religion, information on the number of parish priests is obtained directly from the Palacio Episcopal applying average income and a fixed percentage for inputs. For professionals, the estimation is based on information in the publication Indicadores Económicos regarding the number of professionals, the valuation being made in accordance with results of a direct survey, using a fixed percentage for inputs. For recreational services like sports and other amusements, the gross value of production is obtained from the Boletín Estadístico of the Dirección General de Estadística y Censos, which indicates the number of spectators and the values paid. Inputs are estimated separately for cinemas and sports, using fixed percentages. Broadcasting services are estimated from census figures for 1961, extrapolated by a fixed annual growth rate and by deducting 10 per cent for inputs. For photographic studios, the estimates are based on a survey conducted by the Dirección General de Estadística y Censos in 1963, extrapolated by the intercensal growth rate between the 1951 and 1961 censuses.

In order to calculate the value of domestic services, an estimate is made of the number of persons employed, and the annual average wages in four regional areas are applied. The number of persons employed is based on 1961 census figures and average growth rates for these regions, based on the intercensal period 1951-1961. The wage rate is estimated annually, applying the change in the cost-of-living index. For laundries and other personal services, the estimates are interpolated and extrapolated on the basis of census figures, which also determine the input structures.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

Government consumption expenditure is obtained directly from government sources, established as the sum of the remunerations and purchases of goods and services.

##### Private final consumption expenditure

Estimates of private consumption expenditure are for the most part obtained by using the commodity-flow method. Adjustments are made for distribution and other costs included in the retail value. Estimates for services are articulated closely with the value-added estimates mentioned above.

##### Increase in stocks

Increase in stocks is estimated for goods in the agricultural, manufacturing, trade and construction sectors. The estimation is based on information obtained on stored agricultural products, the stocks of the manufacturing and trade industries on the basis of the annual surveys of the Dirección General de Estadística y Censos, while the stocks of construction refer to those of public construction.

##### Gross fixed capital formation

Private capital formation is estimated on the basis of data on domestically produced and imported capital goods and statistics on construction and repair work. The import data are adjusted to include import duties, trade margins and

installation costs, and by corresponding data for domestically produced capital goods. Estimates of private construction are based on the data used in preparing the production account for the construction sector. For public expenditure on capital formation, the requisite data are obtained from official sources.

#### Exports and imports of goods and services

Data on exports and imports of goods and services are obtained from the official balance of payments. Export data (value and volume) of coffee are obtained from the Compañía Salvadoreña de Café; the other merchandise data are furnished monthly by the Dirección General de Estadística y Censos. The basic sources used for the estimation of exports and imports of services are the Departamento de Control de Cambios del Banco, the Dirección General de Migración, the banking accounts, and direct surveys of insurance companies, embassies, consulates and other public and private offices.

#### Cost structure of the gross domestic product

##### Compensation of employees

Compensation of employees combined with operating surplus is obtained as a residual.

##### Operating surplus

See above.

##### Consumption of fixed capital

No specific information is available.

##### Indirect taxes and subsidies

The estimates are derived from the government accounts.

#### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Value added is estimated at constant prices by using volume indexes for each item.

##### Mining and quarrying

The value added of sand, clay and limestone quarrying is deflated by a price index of clay bricks calculated in the manufacturing sector, whereas the value added of salt production is extrapolated by a volume index based on annual production data.

### Manufacturing

Double deflation is used; output and input of each subitem are deflated by price indexes from the annual surveys.

### Electricity, gas and water

For electricity production, value added is extrapolated by a quantity index based on kilowatt-hours produced; the value added of water supply is deflated by the cost-of-living index.

### Construction

Gross output is deflated by a weighted price index based on the combination of an index for construction materials and the cost-of-living index. Value added is estimated by applying the gross output estimate at constant prices to the input-structure at current prices.

### Wholesale and retail trade, restaurants and hotels

For wholesale and retail trade, value added at constant prices is obtained by using a volume index weighted by the marketed goods originating in agriculture and manufacturing or imported. In the process of obtaining this combined index, goods that are not traded in the market are deducted from agricultural production, manufacturing production and imports, respectively. For restaurants and hotels, current values are deflated by the consumer price index computed by the Dirección General de Estadística y Censos.

### Transport, storage and communication

The estimation of value added at constant prices for transport, storage and communication is made by volume indexes, such as the index of ton-kilometres transported, the index of passenger-kilometres, and an index based on the number of vehicles registered for each activity (rented cars). The figures at current prices are maintained for harbours, storage and communications, since no adequate deflators are available.

### Financing, insurance, real estate and business services

For services provided by the banking system, value added is extrapolated by an index based on the total number of cheques cleared and paid, for the rest of the financial services it is deflated by the cost-of-living index, and for real estate it is deflated by multiplying the number of urban and rural dwellings in the current year by the rent paid in the base year.

### Community, social and personal services

The value added of public administration is deflated by the cost-of-living index. The same applies to laundry services, barbers' shops, broadcasting stations, medical clinics, etc. For domestic services, constant-price estimates are obtained by applying wages paid in the base year to the number employed in this activity in the current year. For the services of private education, professionals and photographers, the current-price figures are maintained in the absence of adequate deflators.



## Expenditure on the gross domestic product

The expenditure side of the gross domestic product is not estimated at constant prices.

### ETHIOPIA

The presentation that follows is mainly based on the comprehensive information contained in "National accounts of Ethiopia", a paper prepared by the Central Statistical Office of Ethiopia for the Interregional Seminar on the Revised System of National Accounts, held at Caracas in December 1975.

## Introduction

### History

The first attempt to compile national accounts in Ethiopia was made in 1952 by the State Bank of Ethiopia.

In 1964, the Central Statistical Office, on the instructions of the Inter-Ministerial Committee of Statisticians, undertook the responsibility for compiling national accounts statistics and presented provisional estimates for the period 1961-1963 in Statistical Abstract.

### Approaches used

#### Gross domestic product

The main approach used to estimate the gross domestic product is the production approach.

#### Gross domestic product by kind of economic activity

The production approach is used for most industries, since this is the only feasible approach at the present stage of statistical development in the country. It has been possible, however, to use both the production approach and the income approach in measuring the output of the modern sectors of the economy: manufacturing industries (establishments with 10 or more employees), the electricity and water industry, mining, banking, insurance and real estate, public administration and defence, education and health services.

#### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure and exports and imports of goods and services. A combination of the expenditure approach and the commodity-flow approach is used to estimate gross fixed capital formation. Private final consumption expenditure is obtained as a residual, which also includes increase in stocks.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Agricultural sample surveys

Government reports and records for mining

Annual suveys of manufacturing industries

Addis Ababa building permits

Family budget studies, 1967/68

Annual reports or accounts of transport enterprises

Government records

### Cost structure of the gross domestic product

No estimates made

### Expenditure on the gross domestic product

Government records and reports

Addis Ababa building permits

External trade statistics

### Methods and sources of estimation

Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

### Agriculture, hunting, forestry and fishing

For the bench-mark years (1961-1963), the estimation of value added for agriculture was based on population figures, expert opinions regarding per capita consumption of food grains, assessments by the former Planning Board and the Ministry of Agriculture regarding the distribution of various crops in total food grains and the number of livestock by type, and wholesale prices of agricultural products collected by the National Bank. In recent years information from the qualitative crop surveys conducted by the Ministry of Agriculture has also been used in indicators of the annual changes in crop output, besides information on area cultivated derived from national sample surveys. Net output by type of plant product is then estimated by deducting for seed inputs and losses in the field, multiplied by wholesale prices adjusted for trade and transport margins, and summed up to provide the value added of plant production.

For the current years both gross output and net output are estimated by using information on the area cultivated by type of crop and information on yield, seedlings and loss rates, also projected by an assumed growth rate.

In the case of livestock production, the bench-mark estimates (1961-1963) were based on the number of livestock by type then estimated by the Ministry of Agriculture, gross output was derived by taking into account technical factors such as age and sex distribution, reproduction rates, slaughter rates, milk yield per cow, etc., and value added was arrived at by deducting the estimated cost of salt used as intermediate consumption. For subsequent years both gross output and value added have been derived by applying growth factors, usually linked to the population growth rate.

Value added for the home processing of agricultural tools and household utensils is estimated from assumed stocks of such implements and annual replacement needs.

For hunting the external trade statistics, which provide data on skins of game animals exported, are the only source of information. The gross value of output is assumed to be twice the value of exports, and value added is derived by deducting 30 per cent from the gross value of output as traders' margin.

For forestry the data sources include the Forestry Department of the Ministry of Agriculture, which provides estimates for the production of industrial wood, wood for fuel, etc. Another source is the survey of woodworking industries, while the consumption of firewood is assessed on the basis of family budget studies undertaken in 1967/68. Data on prices of industrial wood and firewood are available from the annual surveys of manufacturing industries and retailers of firewood in Addis Ababa. Value added is derived by deducting 10 per cent from the gross value of production of industrial wood and firewood.

For fishing the main sources of information are the external trade statistics and the Fisheries Department of the Ministry of Agriculture, which makes annual estimates of domestic consumption of marine products. First the wet-weight landings of various types of fish and other marine products are determined, and then they are multiplied by an estimated average price to arrive at the gross landing-stage value. Value added is derived by deducting 10 per cent from the gross landing-stage value.

#### Mining and quarrying

The Ministry of Mines provides data on the quantity and value of mineral products produced annually. In addition, the annual budgetary reports of the Ministry of Finance provide data on expenditure in mining operations and prospecting and exploratory activities carried out by the central Government.

The value of production of each mineral product is estimated by multiplying the reported quantity produced by its average price, summed up to arrive at the gross value of production for the mining sector. This total output value is then broken down into compensation of employees, operating surplus and intermediate purchases by using arbitrary percentages, confining value added to the sum of compensation of employees and operating surplus.

## Manufacturing

Gross output data are obtained by the Central Statistical Office through its annual surveys of manufacturing industries. The valuation is at ex-factory prices. Value added is obtained by deducting the cost of inputs of raw materials, fuel and energy from the gross value of production. Owing to the inadequacy of basic data in the annual surveys of manufacturing industries there are, however, cases in which indirect means of estimation have been used. No study has been made on repairs and garage services, although a list of garage registrations is available in the Ministry of Commerce and Industry. Under-coverage, poor response or no response by the manufacturing establishments have greatly hampered the improvement of the quality of data and methods of estimation.

No appropriate sources of information have as yet been found for handicrafts and small-scale manufacturing. The results of the annual surveys of manufacturing industries, external trade statistics, registration data, trade inquiries, etc. have been used as indicators for the nature and amount of inputs used in the various activities covered by this sector. Technical coefficients appropriate to each processing activity are made use of, but in recent years it has been decided to derive value added by projecting with half the growth rate observed for the output of large-scale manufacturing.

## Electricity, gas and water

For the electricity sector, data are obtained from the annual returns to questionnaires submitted to firms engaged in this activity, sufficiently complete to permit the estimation of value added using either the production approach or the income approach.

With regard to water supply services in Addis Ababa and Asmara, the main sources of data are their annual reports. In the absence of actual data for the other municipalities, one third to one fourth of the total current receipts is assumed to represent their gross value of production, and a further 8-9 per cent is deducted for intermediate inputs to arrive at value added.

## Construction

The sources of data for new construction in the private sector are Addis Ababa building permits, household expenditure surveys conducted in 1968 and various population estimates. Some of the sources are consulted merely to serve as indicators. For construction in the public sector the main sources of data are the reports on budgetary revenue and expenditure published annually by the Ministry of Finance, and the returns to questionnaires sent to municipalities and public utilities, corporations and enterprises.

The current value of construction work put in place is first estimated by adjusting the total value of Addis Ababa building permits for timing and underreporting. Private construction work in other towns is estimated by applying the ratio of per capita consumption expenditure in Addis Ababa to the per capita consumption expenditure in all other towns. Based on certain assumptions, the total construction value of rural dwellings is also estimated. Value added is obtained by applying the arbitrary percentages of 50 and 75 per cent to the cash and in kind components of gross output, respectively. No actual data on the cost structure of the gross output are available for the construction industry.

### Wholesale and retail trade, restaurants and hotels

Trade margins are estimated separately for export goods, import goods and locally produced goods. For information on export and import goods external trade statistics are the main source. For all imported goods the gross trade margin is estimated by a 15 per cent margin on the value of imports, based on the 1963 trade inquiry. Similar assumptions are made for goods produced locally, for which sources include either "guesstimates" of the marketable surplus of agricultural products and shemma cloth production or the annual surveys of manufacturing industries. Estimates for subsequent years are derived by projecting the bench-mark quantities by appropriate growth rates that take into account the growth rate of the urban population. In order to arrive at value added, an arbitrary 10 per cent is deducted from the gross trade margin.

Restaurants and hotels are included in community, social and personal services.

### Transport, storage and communication

For railway transport the estimates are based on the annual reports or accounts of the Franco-Ethiopian Railway and the Railway Administration in Eritrea. For road transport the gross output is estimated on the basis of data on passenger-kilometres and ton-kilometres from traffic counts during the years 1957-1963, from motor-vehicle registration statistics of the Ministry of Communications, and passenger fares and freight rates in force along the major highways. Estimated maintenance, fuel and other material costs are deducted to arrive at the value added. For water transport the data available include the Marine Department's annual statistics on cargo loaded and unloaded at the ports of Assab and Massawa, rough estimates of stevedoring and forwarding charges at the two ports, and the number of ships, motor boats and rafts operating along the Red Sea coast and inland waterways (transportation on oceanic routes excluded). Value added is put arbitrarily at 50 per cent of the gross value of output and at two thirds in the case of port services. For air transport the estimates are based on the annual reports and profit-and-loss accounts of the Ethiopian Airlines.

For communication the estimates are based on the annual reports of the Post Office Department, and the annual reports and income and expenditure accounts of the Board of Telecommunications.

### Financing, insurance, real estate and business services

The main source of data for the banking sector is a summarized profit-and-loss statement provided annually by the National Bank of Ethiopia. For the insurance sector the requisite data are obtained from the annual reports of the Insurance Controller. For real estate a profit-and-loss statement is collected annually from the National Resources Development, while the information for other financial intermediaries is taken from their annual reports.

For ownership of dwellings the bench-mark estimates for 1961-1963 were based on import data, special inquiries and household surveys. For urban areas, gross rental income is obtained by multiplying the total number of housing units by assumed actual and imputed average annual rental rates. For rural areas the total number of tukuls is multiplied by the assumed average value per tukul. By assuming an average life of 10 years, both gross rental income and value added have been

estimated as being equivalent to the annual depreciation charge. Since 1967/68, however, value added has been projected by a growth rate of 8.5 per cent for urban areas and 2 per cent for rural areas.

Business services are included in community, social and personal services.

#### Community, social and personal services

The value added of public administration and defence is taken to be equal to total wages and salaries paid to government employees, including payments in kind. For the central Government the sources of data are the Ministry of Finance's annual reports on budgetary revenue and expenditure, for the Addis Ababa and Asmara municipalities and extrabudgetary agencies the sources of data include returns to annual questionnaires, and for other municipalities the main source of information is the Municipalities Department of the Ministry of Interior.

The estimates of educational services are based on government reports, including annual information on the number of students, teachers, etc. and budgetary revenues and expenditures. Value added for non-governmental schools is estimated on the basis of the number of students enrolled in such schools and the assumption made that the value added per student is equal to two thirds of the value added per student in government schools. Value added for medical and other health services is mainly based on the annual budgetary revenue and expenditure reports of the central Government. Regarding the output of private practising physicians and other medical practitioners, as well as the output of mission health services, no appropriate data sources have as yet been found. The value added of domestic services is derived by estimating the number of domestic servants in Addis Ababa, other urban areas and rural areas separately, and multiplying these estimates by assumed average pay rates. In the absence of any other comprehensive and current information for the other services, the former Planning Board Office's estimate for 1962 is used as a bench-mark and raised by an arbitrary 10 per cent every year to derive the value added for subsequent years.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

The required information is obtained from the report on budgetary revenue and expenditure published annually by the Ministry of Finance, data supplied by the Ministry of Finance on public enterprises and extrabudgetary agencies, and returns to questionnaires from municipalities.

Government consumption expenditure is obtained as the sum of compensation of employees and purchases, less sales of goods and non-factor services on the current account. The consumption of fixed capital is excluded owing to the difficulty of making imputations. The actual computations involve a reclassification of various outlays as current expenditure, which is treated in the budget as capital expenditure and vice versa. Estimates for a purpose classification of government consumption expenditure are not prepared.

##### Private final consumption expenditure

Private final consumption expenditure is obtained as a residual, inclusive of stock changes. Direct estimation of private consumption expenditure has not been

attempted owing to lack of comprehensive information. When the results of the 1971/72 household economic survey are fully processed, it is hoped that this source, at least can be used to check the residual estimate.

#### Increase in stocks

Changes in stocks are not estimated, and are thus included in the residual estimate for private final consumption expenditure.

#### Gross fixed capital formation

Capital formation in land, buildings and works is estimated by piecing together data from different sources. For the public sector the sources mentioned under government final consumption expenditure provide adequate information for estimating the public sector's capital formation in building and construction through the expenditure approach.

For private construction in urban areas the only data available are derived from the statistics of building permits for new dwellings and other construction compiled annually by the Addis Ababa municipality. The value of the building permits is adjusted for timing by taking the average of the last two years, and a further 5 per cent for underreporting. The value of private construction work in all other urban areas is estimated by applying the ratio of per capita consumption expenditure at Addis Ababa to the per capita consumption expenditure in other urban areas. For rural areas the number of tukuls built in a given year is assumed to be a function of rural population and its growth rate, the number of persons per tukul and their replacement rate, and then multiplied by an assumed average cost per tukul. The value of other construction is put at 18 per cent of the value of new rural dwellings.

Import statistics are the main source used for the estimation of capital formation in machinery and equipment. Import data are compiled by commodity, but arbitrary percentages have to be made for some commodities which are used by both households and businesses. Import duties, transport charges, trade margins and installation costs are added to the c.i.f. value of capital imports to arrive at the cost of capital goods to the final user. The ratios for such additions have been obtained from trade inquiries in 1964 and 1965.

#### Exports and imports of goods and services

For the current transactions of exports and imports of merchandise and other goods and services, the Ethiopian external trade statistics are the main sources of data. These statistics are recorded at the time the merchandise cross the Ethiopian border and no special adjustment is made for changes in ownership. The balance of payments is prepared by the National Bank of Ethiopia, but certain short-comings have been observed, for example, because of a lack of data, no adjustments are made for direct sales in the domestic market to non-residents and direct purchases by Ethiopian residents abroad.

#### Cost structure of the gross domestic product

The cost structure of the gross domestic product - compensation of employees, operating surplus, consumption of fixed capital and indirect taxes net of subsidies - is not estimated.

## Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

For plant products, the current net output is revaluated at base-year producer prices, for livestock products and the products of home processing, value added at current factor cost and at constant factor cost are assumed to be the same. The same assumption is used for forestry, fishing and hunting.

#### Mining and quarrying

Current estimates are deflated by the Addis Ababa retail price index.

#### Manufacturing

The value added of large-scale manufacturing is extrapolated by a volume index of industrial production. For handicrafts and small-scale manufacturing, however, real output is obtained by deflating value added by half the change in the implicit price index of large-scale manufacturing.

#### Electricity, gas and water

For electricity, value added is extrapolated by an index of electricity generated, but for water supply, the value added at constant prices is assumed to be equal to the value added at current prices.

#### Construction

For construction, the value added at current prices and constant prices is the same, since data are not available for the construction of either volume or price indexes.

#### Wholesale and retail trade, restaurants and hotels

For the trade sector, the current values are deflated by the wholesale price index for exports, the wholesale price index for imports and the average of the two indexes for export commodities, import commodities and locally produced and marketed goods. Restaurants and hotels are included in other services, which are deflated by the Addis Ababa retail price index.

#### Transport, storage and communication

For road transport, value added is extrapolated by indexes of passenger-kilometres and ton-kilometres, for water transport it is extrapolated by a volume index of cargo handled, for railway transport and air transport it is extrapolated by a weighted volume index of passenger-kilometres and ton-kilometres, for telecommunications it is extrapolated by a weighted volume index based on the number of telephone calls made and the number of telegrams handled, and for postal services it is deflated by the retail price index for Addis Ababa.



## Financing, insurance, real estate and business services

Current estimates are deflated by the Addis Ababa retail price index.

## Community, social and personal services

Current estimates are deflated by the Addis Ababa retail price index for most private services. For public administration and defence, half the change in this index is used as a proxy for a wage-rate index. Domestic services are extrapolated by using a volume index of employment, educational services by a weighted quantum index based on the number of teachers and students, and medical and other health services by a weighted index of quantum indicators based on the number of patients, doctors, nurses and dressers.

## Expenditure on the gross domestic product

The expenditure side of the gross domestic product is not estimated at constant prices.

## FIJI

The presentation that follows is mainly based on information provided by the Bureau of Statistics in the series National Accounts Studies - particularly volume 3, The National Accounts of Fiji 1968-1972, published in 1973. Supplementary information was received from the Bureau of Statistics in November 1977.

## Introduction

### History

The first national income estimates were made in 1954 from a national income study for 1950-1953, later published in 1956 in Council Paper No. 44, The Pattern of the Fiji Economy.

In 1966 the Central Planning Office prepared estimates of gross domestic production and consumption in Fiji for the year 1963 to be used for the Fiji Development Plan 1966-1970.

The first systematic attempt at national income estimation was undertaken in 1970, based on the former SNA. The estimates for 1965-1967, mainly based on income-tax statistics, were published in The National Income and Balance of Payments Accounts of Fiji. 1/

In 1973 the Bureau of Statistics adopted the revised United Nations System of National Accounts (present SNA) and presented three reports with estimates and descriptions of the national accounts of Fiji, the latest of them entitled The National Accounts of Fiji, 1968-1972.

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1/ Michael Ward, The National Income and Balance of Payments Accounts of Fiji (Suva, Ministry of Finance, 1970).

## Approaches used

### Gross domestic product

As a rule the production approach is used to estimate the gross domestic product.

### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries, such as agriculture, mining, manufacturing, electricity, gas and water and construction; for the trade sector it is used in combination with the commodity-flow approach. The income approach is used to estimate the value added of restaurants and hotels, and most of the subsectors of financing, insurance, real estate, business services, community, social and personal services, including producers of government services. The transport industry was previously estimated using the income approach, but is now mainly based on the production approach.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure and exports and imports of goods and services. The estimation of gross capital formation is also mainly based on the expenditure approach, while private final consumption expenditure is mostly based on the commodity-flow approach.

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Household budget surveys, 1968 and 1972

Annual industrial censuses

Annual censuses of building and construction

Census of distribution and services, 1970

Income-tax statistics

Annual surveys of the transport industry

Government accounts and budgets

### Cost structure of the gross domestic product

Government accounts and budgets

## Expenditure on the gross domestic product

Government accounts and budgets

Surveys of capital investment

Foreign trade statistics

## Methods and sources of estimation

Current prices

## Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

### Agriculture, hunting, forestry and fishing

This major division of economic activity is for Fiji most adequately divided into the following four sections: sugar, copra, subsistence farming, and other agriculture. Total sugar-cane and copra output is estimated from material inputs revealed by annual industrial censuses. An economic analysis of cane farmers and copra growers undertaken by the agricultural department has indicated the cost structure involved, thus establishing the value added estimates.

Separate estimates are made for the subsistence farming sector. The bench-mark estimate of subsistence output is based on the 1968 agricultural census, the 1965 rural-urban household expenditure survey and data published by the Natural Resources and Bureau of Statistics on agricultural output and prices. The figures comprise domestic production consumed at producers' prices (both arable and livestock products), value added by rural household services, which would be necessary to sell the goods produced in the event of a market, and seed retained for planting. Annual increases in subsistence production are based on estimates of population growth and an index of rural produce prices. Gross output of other agricultural produce is estimated through the household budget surveys held in 1968 and 1972, and case studies undertaken by the agricultural department form the basis for the intermediate consumption estimates.

### Mining and quarrying

The estimates are based on annual industrial censuses, which cover all establishments in mining and quarrying, as well as manufacturing, electricity, gas and water, without restriction as to size.

### Manufacturing

The estimates are based on annual industrial censuses carried out since 1970. Data on gross output and intermediate consumption are included, and the sampling frame has been enlarged over a period of time to increase the data collected. The industrial census in 1970 covered all establishments, however, and included for the first time data on industrial activity in the public sector, as well as in the private sector. Slaughtering is classified as a manufacturing activity, but all of

Fiji's slaughterhouses have their own retail outlets which cover the major part of their business, and only in a few cases has it been possible to collect separate accounts for retailing and manufacturing activities. Similar problems arise for tailoring and drapery stores which contain tailoring sections. No attempt is made to collect information on Fiji's cottage industries, and there is no doubt that local handicraft manufactures are considerably underestimated. The over-all response to the 1970 census was nearly 94 per cent in terms of employment and cross-checkings with trade report figures have indicated that the census figures are of good quality.

#### Electricity, gas and water

The estimates are based on the industrial censuses, which also include electricity, gas and water establishments.

#### Construction

Estimates for construction are available from building and construction censuses, conducted annually since 1970. The unit of reporting is the firm; all firms in the private sector classified as building and construction firms are required to complete a questionnaire. As many as 86 per cent of the employees in the construction industry were accounted for by the 1973 census results. The information in the questionnaire deals with gross output, intermediate consumption and compensation of employees. Government bodies engaged in construction are covered through their annual reports and operating budgets. The element of the owner-occupied builder in Fiji is estimated on the basis of the difference between the census residential buildings output and the value of residential completion certificates as indicated in Current Economic Statistics.

#### Wholesale and retail trade, restaurants and hotels

Wholesale and retail trade figures have been based on the Inland Revenue Department statistics and the census of distribution, 1970. The commodity-flow method is applied as producers' values and c.i.f. import values are grossed up by the margin established in the 1970 census of distribution to arrive at purchasers' values and gross output of the trade sector. Intermediate consumption is also based on Inland Revenue statistics.

Estimates for hotels, restaurants etc. are based on income tax statistics, tourist statistics and the 1970 census of distribution. Tourist statistics showed the receipts of hotels from accommodation, food, bar and liquor sales for 1970 and the census of distribution provided estimates of gross output of restaurants for the same bench-mark year. Recently a survey of the hotel industry has also been conducted.

#### Transport, storage and communication

Until 1970, the estimates of the transport industry had been mainly based on statistics released by income tax authorities with the concomitant two-year delay. For the calendar years 1970 and 1971 a survey of the transport industry of Fiji was held, covering all establishments employing more than five employees operating in the transport sector of the economy, i.e. buses, taxi-cabs, freight transport by road, rental cars, cruise operators, shipping and air transport. A survey of Fiji's travel agents was also undertaken, and a questionnaire designed to highlight

the major costs and revenue sources of the transport industry was submitted to 126 establishments in June 1972. In order to avoid one serious weakness of the survey, the estimation procedure used for the operation of taxi-cabs is not the same as the method used for the other sections. The income-tax estimates for previous years are inflated by the increase in the registration statistics for the taxi-cab section. For communication, statistics are available in the Post and Telegraph's annual reports on telephone calls and mail items posted. Approximately 60 per cent of the post and telephone revenue is assumed to be derived from telecommunication and 40 per cent from the postal service and the constructed index is weighted accordingly.

#### Financing, insurance, real estate and business services

The estimates of banking are obtained from income-tax statistics. A service charge is imputed as recommended, including interest received and interest paid as part of gross output and intermediate consumption, respectively. For insurance the estimates of value added are obtained from annual insurance surveys conducted by the Bureau of Statistics. Business services covering the activities of accountants, legal services, engineers etc. are estimated on the basis of income-tax statistics.

Estimates for ownership of dwellings are made separately for urban and rural areas. The household budget survey in 1968 indicated an imputed rent per urban household, grossed up by the rent section of the consumer price index and the growth in urban population. For rural areas an estimated rent has been assumed for the rural population in 1968 and grossed up annually by a rural price factor and the growth in rural population. Rent received by the Government is derived from volume 1 of the National Accounts Studies, entitled An Economic and Functional Classification of Government Accounts, and rent received by individuals is calculated from data revealed by income-tax statistics. Corporate sector real estate is also estimated from income-tax statistics.

#### Community, social and personal services

The estimates for producers of government services are based on the operating budget estimates and the report on government accounts and finances. The 1970/71 survey of non-profit institutions provides the basis for the estimates of private non-profit services to households. Urban and rural estimates for domestic services are based on previous national accounts series, grossed up annually by the consumer price index and growth in urban population for the urban section, and the local produce price index and growth in rural population for the rural section. For other private services, data are primarily derived from income-tax statistics, and the results of the 1970 census of distribution and services have been used for 1970.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

The estimates of government consumption expenditure are based on the report An Economic and Functional Classification of Government Accounts which is compiled from the central Government's operating and capital budget estimates, the report on government accounts and finances, and the accounts of statutory bodies and local government.

### Private final consumption expenditure

The estimates of private consumption expenditure are mostly based on the commodity-flow method. All items valued at landed cost from foreign trade statistics and producers' values from industrial censuses are grossed up by margins established in the 1970 census of distribution and services. Changes in stocks of retailers and wholesalers are accounted for, as 75 per cent of the increase is deducted from consumers' expenditure at landed or producers' values (the remainder 25 per cent is allocated to industrial inputs).

Methods other than commodity-flow are used to supplement the estimation. Estimates of consumers' purchases of some food items are made on the basis of the 1972 household budget survey. The estimation of gross rents has already been described; water charges are estimated from figures in the annual report of the Public Works Department; the domestic electricity consumption of the Fiji Electricity Authority and Suva City Council is included, and 75 per cent of the output of gas by local gas distributors is assumed as consumers' expenditure. For the services of physicians, estimates are based on the output of physicians as shown in income-tax statistics, and for hospitals etc.; they are based on hospital fees paid to the Government. For entertainment, recreation etc. the estimates are prepared from the 1970 census of distribution and services for cinemas, photographic studios etc. Private school fees are estimated from the 1970/71 survey of non-profit organizations, while the fees for government day and boarding schools etc. are taken from the report on government accounts and finances. Adjustments to produce the private final consumption by residents are made by deducting and adding foreign expenditure in the domestic market and resident expenditure abroad, obtained from the balance of payments.

### Increase in stocks

In the report Gross Capital Formation in Fiji, 1968-1970 (vol. 2 of the National Accounts Studies), detailed information on stock changes is provided for 1968, 1969 and 1970. This information is based on surveys of capital investment of private sector industries, the report on government accounts (vol. 1 of the National Accounts Studies) and the 1970/71 survey of non-profit-making institutions.

### Gross fixed capital formation

The estimates for private industries are collected from past surveys of capital investment; for government industries and producers of government services they are derived from the report on government accounts for national accounts studies, and for producers of private non-profit-making services to households the source is the 1970/71 survey of non-profit-making institutions. The figures for owner-occupied dwellings are taken directly from the completion certificates issued by the medical department. The 1970 and 1971 censuses of building and construction contained information on residential buildings, but a large number of houses constructed by owner-occupiers fell outside the scope of the census.

### Exports and imports of goods and services

The values of exports and imports of goods and services are available from the balance of payments. The general trade system is adopted for recording the foreign trade transactions of merchandise, and annual shipping and aircraft statistics provide valuable information for estimating exports and imports of other goods and services.

## Cost structure of the gross domestic product

Estimates of the cost structure of gross domestic product are made from the various sectoral surveys, taxation data, and the government accounts on which the figures for indirect taxes and subsidies are based.

### Constant prices

## Gross domestic product by kind of economic activity

### Agriculture, hunting, forestry and fishing

Sugar-cane and copra output are extrapolated by production indexes from production data (the same index as the one used for intermediate consumption), subsistence estimates are deflated by an index of rural produce prices, and for other agriculture the rural produce index and slaughterhouse figures are used to obtain constant-price estimates.

### Mining and quarrying

The output of this sector is extrapolated by the gold production index.

### Manufacturing

Appropriate subindexes of the industrial production index are used to extrapolate base-year data.

### Electricity, gas and water

The output of this sector is extrapolated on the basis of electricity and water consumption data.

### Construction

Building and construction output at current prices is deflated by a combined index of wage rates of workers in the industry and of building material prices, weighted 60-40 respectively.

### Wholesale and retail trade, restaurants and hotels

For the wholesale and retail trade, the consumer price index provides a deflator for the constant-price estimates; for restaurants and hotels, value added is extrapolated by the quantity index of output based on statistics on visitor arrivals.

### Transport, storage and communication

The output of this sector is extrapolated on the basis of vehicle registration data, aircraft passenger-miles flown, weight of mail carried and the number of metered telephone calls.

### Financing, insurance, real estate and business services

For insurance, value added is extrapolated by the increase in policies issued during the year and for ownership of dwellings by the increases in urban and rural population, respectively. Other real estate is deflated by the rent section of the consumer price index, while banking and business services are deflated by the consumer price index.

### Community, social and personal services

The consumer price index is used to deflate value added of producers of government services. For domestic services, value added is extrapolated by urban and rural population; for private services elsewhere it is extrapolated by an arbitrary annual growth rate of 5 per cent.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

Government consumption expenditure at constant prices is derived from deflation by the consumer price index.

#### Private final consumption expenditure

The constant-price estimates are made by applying the consumer price index as a deflator for total private final consumption less rural household expenditure, the latter being deflated by an index of rural produce prices.

#### Increase in stocks

Increase in stocks held by the mining and manufacturing sectors is deflated by the inflation revealed by the difference between the current and constant-price estimates in the production account. Increase in other stocks is deflated by the consumer price index.

#### Gross fixed capital formation

For buildings, the implicit price index of value added of building and construction has been used as a deflator. For machinery, vehicles etc., current values are deflated by the index of prices for exports from the developed market economies to developing market economies, taken from the United Nations Statistical Yearbook.

#### Exports and imports of goods and services

Exports in f.o.b. values and non-monetary gold are deflated by the trade index of exports; transport and insurance exports are deflated by a multiple index from the price of aviation fuel re-exports, the increase in the number of Air Pacific flights, and the increase in the number of aircraft passing through Nandi airport. Miscellaneous exports are deflated by the consumer price index. Similar methods are used to deflate imports of goods and services.



## FRANCE

The presentation that follows is mainly based on information prepared by the Statistical Office of the European Communities in 1976 in an annex report entitled "Basic statistics needed for the ESA accounts and tables: present situation and prospects for improvements", information contained in Présentation de la comptabilité nationale française by Bernhard Brunhes of the Institut national de la statistique et des études économiques, information compiled by the United Nations Statistical Office in the late 1960s on the estimation of the value added of various industries, and a report by the United Nations Secretariat entitled "Country practices in national accounting at constant prices" (E/CN.3/464). Supplementary information was received from Institut national de la statistique et des études économiques in June 1968.

### Introduction

#### History

The first official work on national accounts was undertaken shortly after the Second World War by the Commissariat général du Plan modernisation et d'équipement.

The Ministère des finances in 1951 became responsible for national accounting work, the Institut national de la statistique et des études économiques for the preparation and publication of the national accounts as a whole, and the Service des études économiques et financières for the preparation of specific elements of the system, such as the external account and the detailed tables on financial transactions.

Major modifications in the conceptual framework of the French system and in the methods of compiling the estimates were introduced in the period 1955-1968. These modifications are described in Rapport sur les comptes de la nation de l'année 1954 (vol. II), les Comptes de la nation de l'année 1959 (vol. II), Méthodes de la comptabilité nationale cadres et définitions de la base 1959, and in the review Etudes et conjoncture by the Institut national de la statistique et des études économiques.

The first estimates conforming to the present United Nations SNA were prepared in 1972.

Le Système élargi de comptabilité nationale, which is an adaptation by France of the European System of Integrated Economic Accounts (ESA), and closely resembles the present SNA, was introduced in 1976, and its concepts were described in le Système élargi de comptabilité nationale - méthodes. The official estimates are published annually in Rapport sur les comptes de la nation.

#### Approaches used

##### Gross domestic product

As a rule the production approach is used to estimate the gross domestic product.

### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of almost all industries. This is done within the framework of annual input-output tables, using the commodity-flow approach. The input-output tables are available for 90 branches on the basis of identified transactions in goods and services. Since for the input-output tables annual surveys of enterprises and branch surveys are used jointly, the branch and sectoral data can be co-ordinated more effectively.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, gross fixed capital formation, and exports and imports of goods and services. A combination of the expenditure approach and the commodity-flow approach is used to estimate private final consumption expenditure and increase in stocks.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

#### Gross domestic product by kind of economic activity

- Annual agricultural statistics
- Branch surveys of employers' associations
- Annual surveys of enterprises
- Income-tax accounting records (BIC figures)
- Census of distribution and services, 1967
- Transport surveys
- Government budgetary accounts
- Balance-sheets of financial institutions

#### Cost structure of the gross domestic product

- Quarterly surveys of the Ministry of Labour
- Wage statistics
- Government budgetary accounts
- Income-tax accounting records (BIC and BNC figures)
- Annual surveys of enterprises
- Balance-sheets of financial institutions

## Expenditure on the gross domestic product

Government budgetary accounts

Family budget expenditure surveys

Income-tax accounting records

Annual surveys of enterprises

External trade statistics

## Methods and sources of estimation

### Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, except for the amount of value-added tax, for which no breakdown by kind of economic activity is available.

### Agriculture, hunting, forestry and fishing

The Ministère de l'agriculture provides in particular all the output figures for quantities and prices. Figures on intermediate consumption are mainly derived indirectly from the suppliers of products used in agriculture. The information available is highly detailed.

Bench-mark information is derived from the agricultural census of 1955, and a master sample survey conducted in 1963/64 to update the census information and serve as a sample basis for other surveys on special subjects. A new general agricultural census took place in 1970, and a special structural survey in 1975 was conducted by the Ministère de l'agriculture.

Traditionally, the estimation of agricultural output is based on the total area of land used and the yield per hectare for the different crops; the information is furnished by local agricultural experts and professional organizations. For a few crops (cereals, maize, potatoes and lavender) information is gathered on a sample basis.

For livestock, a survey on the structure of bovine herds is undertaken every 12-18 months, supplemented every three or four years by a more detailed survey. Information on the stock of sheep is provided by a two-stage sample survey conducted every three years. Meat production (controlled slaughter) is derived from information provided by slaughterhouses plus net export of live animals. Milk production surveys are conducted, to measure the milk collected monthly.

Agricultural services and hunting are included in the agriculture sector and no separate estimates exist. Own-account consumption of agricultural products is estimated for the base year 1971 by means of household budget surveys and extrapolated from trends observed in the preceding period.

For forestry the production figures are based on information provided by forestry producers to the Ministère de l'agriculture on quantities of wood delivered.

For fishing, information on production (quantity and value), the number of fishermen employed and the tonnage of boats is provided by the Secrétariat général à la marine marchande (Ministère des transports).

#### Mining and quarrying

For all industrial branches, the main sources consist of the branch surveys carried out by the employers' associations and the annual surveys of enterprises. For more detailed information, see under "Manufacturing".

#### Manufacturing

The main sources of information consist of the branch surveys carried out by the employers' associations and the annual surveys of enterprises. The branch surveys record annual or quarterly outputs (or sales) in values and/or quantities, and also producers' stocks in terms of physical quantity and productive capital (not systematically recorded). Figures on intermediate consumption are also provided occasionally.

The annual survey of enterprises breaks down activities by product, records the sales of 600 products, intermediate purchases of 100 products for enterprises employing more than 100 wage-earners and salary-earners, and a smaller number of products for other enterprises. Gross fixed capital formation is broken down into a number of headings such as transport equipment, building and construction, tools, land and buildings. The annual survey of enterprises is carried out by the competent ministry or by the Institut national de la statistique et des études économiques, and covers all large enterprises and a representative sample of small enterprises.

In order to obtain economic data for non-agricultural enterprises, the two statistical sources - copies of the documents in the possession of the tax authorities (BIC figures) and the annual survey of the enterprises - are merged in the unified system of company statistics. The two sets of data are collated individually for 2,000 large enterprises and by sector of activity for small enterprises.

#### Electricity, gas and water

The estimates are based on the branch surveys carried out by the employers' associations and the annual surveys of enterprises. See under "Manufacturing" for more information.

#### Construction

Again, the main sources are the branch surveys of the employers' associations and the annual surveys of enterprises. Government information is available on public works, etc., and annual information is also obtained by analysing BIC figures received by the tax authorities, by type and possibly by user-sector.

The activity of small construction units is estimated from the results of three surveys: the annual surveys of enterprises in construction and public works, the branch survey of public works and a business cycle survey by the Institut national de la statistique et des études économiques. Own-account construction is estimated on the basis of exact sources, especially for the large national enterprises and dwellings.

#### Wholesale and retail trade, restaurants and hotels

For the trade sector, bench-mark information is provided by the 1967 census of distribution and services. Annual fiscal information on turnover is provided by the tax authorities (BIC figures), but it is only used to check the figures obtained from the evaluation of trade margins, which is an alternative approach. The study of trade margins and distribution channels, classified by commodity and users, is based on estimates provided by professional organizations. For 1973 the distribution network for each of the 600 products has been identified and a trade margin worked out. These trade margins are updated first and foremost for products for which new trade margins are fixed by law. Intermediate consumption is estimated from indirect sources.

The estimates for restaurants and hotels are mainly based on tax statistics.

#### Transport, storage and communication

For estimating the value added of the transport sector, the main statistical sources are the transport surveys, which are used for the estimation of gross output, the accounts of nationalized enterprises, which are used to estimate the intermediate consumption of those enterprises, and structural surveys and other indirect sources, used to estimate the intermediate consumption of the other enterprises.

For railways the accounts of the Société nationale des chemins de fer français are used. For the transport of goods by road, information is obtained from the annual transport surveys conducted by the Service statistique du Ministère des transports. In the case of urban transport, the sources used are the accounts of the Régie autonome des transports parisiens and the Service statistique du Ministère des transports or the Fédération nationale des transporteurs routiers; for pipeline transport information is furnished by the Direction des carburants du Ministère de l'industrie; for inland water transport, the statistics are provided by the Office national de la navigation and for maritime transport by the Secrétariat général à la marine marchande. For air transport, information is taken from the annual surveys or provided by the three enterprises concerned. For services allied to transport the annual surveys and fiscal declarations are used, and for communication the production is estimated on the basis of the annual reports of the Postes, Télégraphes et Télécommunications.

Intermediate consumption for each subgroup is estimated for the base year on the basis of structure surveys with respect to production costs, and is then projected for the current year.

## Financing, insurance, real estate and business services

For credit institutions all the necessary economic and financial information can be obtained from the records of the Banque de France for the central banking authorities, from the Commission de contrôle des banques and the standardized accounting plans with which credit institutions must comply, from the balance-sheets of all other credit institutions, and from the balance-sheets kept by the Commission for stock-exchange transactions by investment companies.

For insurance, the economic and financial transactions of the insurance enterprises proper are recorded on the basis of information provided by the Direction des assurances du Ministère de l'économie. For mutual insurance companies, which are counted as financial institutions, the information is provided by annual surveys of the accounts of all such companies, conducted by the Ministère de la santé.

The value added of real estate is estimated on the basis of fiscal statistics (BIC figures) and special surveys. Periodic surveys conducted by the Institut national de la statistique et des études économiques (the latest being in 1973) provide data on rents actually paid, classified by housing area, standard of comfort and number of rooms. Owner-occupied dwelling rents are imputed from these data for each of the above categories. The estimated rents are combined with the number of housing units in each category, obtained on the basis of population censuses.

Business services are mainly estimated from tax statistics.

## Community, social and personal services

The main statistical sources used for the general government sector are an accounting plan for government enterprises and the budgetary accounts; other sources are described in more detail under "Government final consumption expenditure".

For the services of welfare institutions, some social and related community services, amusement and certain recreational services, the accounts of the different categories of private non-profit institutions are estimated on the basis of a detailed study conducted by the Centre de recherche et de documentation sur la consommation for 1971, and extrapolated for the other years by means of growth indicators.

For other community and social services the estimates are classified by type of producer, on the basis of a number of different elements. For example, for radio and television, details are obtained from broadcasting data published in the public accounts; for services rendered by commercial and professional associations, production is estimated on the basis of tax information collected through the various associations; and for other services in this category the principal sources are the statistics of fiscal declarations of income.

In estimating domestic services, a distinction is made between full-time and part-time wages. For each of these two categories, remuneration is estimated by multiplying the number of people on the work force by the wage-rates and then adding social assessments obtained from surveys or from the social security organization.

## Expenditure on the gross domestic product

### Government final consumption expenditure

In estimating government final consumption expenditure, numerous statistical sources, such as basic government accounting data, are analysed. For central Government, in addition to the budgetary accounts, an accounting plan is used for enterprises. Until 1978, when the new ESA was adopted, there had been no analysis by purpose of general government expenditure. For other bodies classified under central Government, numerous statistical sources are available; public enterprises have an accounting plan, and data on other bodies are obtained from public accounts, from small-scale surveys or from other indirect sources. For local government, the centralized accounting scheme is used, the degree of detail depending on the size of the administrative unit in question. For social security funds, an accounting plan is adopted for the general scheme and various sets of accounts are used for the special schemes.

### Private final consumption expenditure

The commodity-flow approach is used in conjunction with the expenditure approach to estimate private final consumption expenditure. A balance is achieved between resources and used for 600 products, of which 250 are consumer goods, prepared for the annual input-output tables. The private consumption estimates are also based on the results of expenditure surveys carried out by the Institut national de la statistique et des études économiques, estimates of fiscal revenues, and statistics of retail sales derived from periodic surveys of large retail stores.

### Increase in stocks

This item is estimated for three categories: producers, users and trade. For certain products, principally petroleum products and products of the iron and steel industry, specific sources are available on the changes in quantity and value for each of the three categories of stocks. The rest is valued on the basis of tax returns (for 40 products) excluding stock assessment. Some problems do arise in valuation and timing.

### Gross fixed capital formation

In the case of gross fixed capital formation in enterprises, data are available from the accounts of the large national enterprises. The main sources are, however, the annual surveys carried out by the Ministère de l'industrie et de la recherche. The results from surveys of business cycles obtained from the heads of enterprises and other sources such as statistics based on income-tax returns from the Direction générale des impôts are also used.

Estimates for general government agencies are obtained from the public accounts. Changes in livestock are retraced to gross fixed capital formation in agriculture. The breakdown of gross fixed capital formation by owner-sector raises a number of difficulties in classification.

### Exports and imports of goods and services

Exports and imports of goods and services are estimated from customs returns including data on the value and quantity of merchandise, and the official

balance-of-payments statement. For services the Institut national de la statistique et des études économiques makes the necessary adjustments on the basis of statistics supplied by the Direction des assurances du Ministère de l'économie and other sources. The adjustments made to the different transactions do not affect the coherent nature of the balance-of-payments figures as a whole. In the national accounts, however, the overseas territories and departments are classified with the rest of the world.

#### Cost structure of the gross domestic product

##### Compensation of employees

Wages and salaries are calculated from various sources such as income and revenue statements of industrial and trading enterprises, the results of quarterly surveys conducted by the Ministère du travail and statistics based on wage declarations of employees. Estimates of social security contributions are derived from the accounts of the social security funds and from certain inquiries made by the Ministère du travail on social charges borne by enterprises. Compensation of government employees is estimated from the government accounts.

##### Operating surplus

Estimates of the income of enterprises are based on fiscal statistics of industrial and commercial profits and other sources. At present, an accounting plan used is based on the general accounting plan that enterprises are required to follow for account-keeping purposes, under which they have to submit data to the tax authorities. It covers the enterprises subject to the BIC system (industrial and trading profits), enterprises subject to the BNC system (non-trading profits) and enterprises subject to neither system. The first category is subdivided into two schemes, which provide data on actual profits each year for the large enterprises and every two years for the smaller enterprises (flat-rate scheme). The second category (mainly professional services) may choose either scheme, but the quality of the information is inferior to the information obtained for enterprises subject to the BIC system. The third category consists mainly of moderate-rent housing, public hospitals, agricultural co-operatives and nationalized enterprises, and the accounts of these enterprises are compiled directly by the Institut national de la statistique et des études économiques.

The accounting plan mentioned above is merged with another source of information - the annual survey of enterprises carried out by the competent ministry or by the Institut - in the unified system of company statistics, the two sets of data being collated individually for enterprises which employ more than 20 persons or fulfil two other criteria relating to the size of business flows and balance-sheets. For other than these approximately 35,000 enterprises there is no individual collation.

Statistical information on agriculture is obtained from the Ministère de l'agriculture. For general Government the sources are an accounting plan, the budgetary accounts and other sources. The transactions of financial institutions, including insurance enterprises, are well covered in the statistics available. The sector providing the least information is the one comprising private non-profit institutions serving households; the Institut national de la statistique et des études économiques has carried out a special study for 1971, the results of which have been extrapolated for the other years.



### Consumption of fixed capital

The depreciation estimates are based on information on the value of capital stock, derived from such varied sources as the BIC accounting plan, financial statements from enterprises quoted on the stock exchange, sample surveys providing information on the stock of capital in agriculture, etc. The figures are later revalued.

### Indirect taxes and subsidies

Indirect taxes and subsidies are estimated on the basis of government sources.

### Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

Double deflation and the commodity-flow method are used, based on annual input-output tables. Estimates at the previous year's prices are prepared by applying quantity indexes to the values of the previous year, subsequently converted to the prices of a fixed base year by a process of chaining.

#### Mining and quarrying

Double deflation and the commodity-flow method are used, based on annual input-output tables. The estimates are calculated at the previous year's prices, the current value series being deflated by price indexes using the preceding year as a base. The constant-price estimates so obtained are subsequently converted to the base year by a process of chaining. The outputs and inputs of the individual industries are in most cases estimated at constant prices by means of price indicators, but in some cases quantity indicators are used.

#### Manufacturing

See under "Mining and quarrying".

#### Electricity, gas and water

See under "Mining and quarrying".

#### Construction

Double deflation and the commodity-flow method are used, based on annual input-output tables. Estimates at the previous year's prices are prepared by applying a volume index based on the value at current prices deflated by a specially estimated price index of construction costs, subsequently converted to the prices of the base year by a process of chaining.

#### Wholesale and retail trade, restaurants and hotels

Double deflation and the commodity-flow method are used, based on annual input-output tables. The trade margins are deflated by specially constructed price

indexes, using the preceding year as a base. The prices used in establishing these price indexes are estimated for each product group as the difference between representative prices on the user side and supply side of the commodity balance. The constant-price estimates are subsequently converted to the base year by a process of chaining.

#### Transport, storage and communication

See under "Mining and quarrying".

#### Financing, insurance, real estate and business services

Double deflation and the commodity-flow method are used, based on annual input-output tables. The estimates at prices of the preceding year are calculated by deflating current value series by price indexes, using the preceding year as a base, except in the case of owner-occupied dwellings, for which extrapolation by a volume index is used, based on values at current prices deflated by an appropriate price index. The constant-price estimates are subsequently converted to the base year by a process of chaining.

#### Community, social and personal services

For producers of government services, except public education, value added is estimated at the previous year's prices by using a volume index of salaries to extrapolate the compensation of employees and indirect taxes, and a price index to deflate consumption of fixed capital. The volume index of salaries is the implicit index obtained by deflating gross salaries paid to government employees by an index of salary rates. Value added is then estimated at base year prices by chaining the indexes. For public education services, value added is estimated by double deflation; intermediate consumption is deflated by the price indexes relating to the products consumed, whereas output is extrapolated by a weighted index of students enrolled at the various educational levels.

For private services see the general approach described under "Mining and quarrying".

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

The constant-price estimates are obtained by using the implicit price index for producers of government services. The estimation consists in calculating this production and production costs at constant prices (except for education, for which a specific volume index is used), and then subtracting the secondary production of marketed goods and services, deflated by price indexes of the production of identified goods and services.

##### Private final consumption expenditure

For food products, clothing and footwear and imputed rent of owner-occupied dwellings, the constant-price estimates are generally obtained by extrapolation and the use of quantum indexes. The basic data for other goods and services are in most cases available in value terms only, and the constant-price estimates are therefore obtained by deflation and the use of appropriate price indexes.

### Increase in stocks

Price deflation is used; current estimates of commodity stocks held by enterprises are deflated by using appropriate price indexes.

### Gross fixed capital formation

The series on gross fixed capital formation (excluding dwellings), classified by commodity, is deflated by using appropriate price indexes; for dwellings the value of construction, expressed at prices of the preceding year, is extrapolated by means of quarterly information on starting dates and average period of construction by type of dwelling.

### Exports and imports of goods and services

Price deflation is used; exports and imports of goods and services are mainly deflated by means of unit value indexes built up from some 400 commodity groups.

## GERMANY, FEDERAL REPUBLIC OF

The presentation that follows is mainly based on information contained in Structure and Sources of National Accounts in Germany, published by Organisation for Economic Co-operation and Development (OECD) in 1975, based on consultations with the producers of the data, existing partial descriptions and scattered reports or publications. The information on constant-price estimates is taken from "Country practices in national accounting at constant prices, issued by the United Nations Secretariat in 1974 (E/CN.3/464). Supplementary information was received from the Federal Statistical Office (Statistisches Bundesamt) in April 1978.

### Introduction

#### History

The first official national income estimates for Germany were published in 1932 by the Central Statistical Office (Statistisches Reichsamt), covering the periods 1891-1913 and 1925-1931.

After the creation of the Federal Republic of Germany in 1949, work was resumed by the Federal Statistical Office (Statistisches Bundesamt), which soon began to publish data covering the origin of incomes by economic branches in the monthly bulletin Wirtschaft und Statistik. These data were supplemented in the 1950s by results covering the distribution of income.

A new complete German system of national accounts was published in 1960, which also included complete financial accounts similar to the ones developed later under the present SNA.

The revision of the national accounts in 1970 led them to be closely assimilated to the SNA system.

In 1972 input-output tables were published for 1965, followed two years later by tables for 1970. The tables are to be published annually, beginning with the 1970 tables.

A further revision of the national accounts in 1977 led to their being more closely assimilated to the ESA system. Official estimates, together with detailed information on content and structure, are published annually by the Federal Statistical Office. 1/

### Approaches used

#### Gross domestic product

The estimation of gross domestic product is mainly based on the production approach.

#### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries. The income approach is used to estimate the value added of domestic services, private non-profit institutions and producers of government services.

#### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, private final consumption expenditure, changes in stocks and exports and imports of goods and services. Gross fixed capital formation is calculated mainly on the basis of the commodity-flow approach, but is supplemented by the expenditure approach in terms of statistics by investing sector.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

#### Gross domestic product by kind of economic activity

Statistics on the production and utilization of agricultural products

Censuses of mining and quarrying industries

Censuses of manufacturing industries

Censuses of construction enterprises

Censuses of electricity and gas industries

Trade censuses, including restaurants

Monthly and annual surveys, including cost-structure statistics for the mining and quarrying, manufacturing, construction, electricity and gas industries

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1/ Statisches Bundesamt, Wiesbaden, Volkswirtschaftliche Gesamtrechnungen, No. 1, Konten und Standardtabellen (Mainz, Verlag W. Kohlhammer, n.d.).

Monthly and annual surveys for trade and transport industries

Receipts and expenditure of general government

Survey of the cost structure of non-agricultural enterprises

Turnover tax statistics

Cost structure of the gross domestic product

Social security statistics

Government accounts

Expenditure on the gross domestic product

Receipts and expenditure of general government

Trade censuses

Censuses of buildings and dwellings

Turnover tax statistics

Quarterly production surveys

Monthly and annual surveys of construction

Annual investment surveys

Foreign trade statistics

Methods and sources of estimation

Current prices

Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

Agriculture, hunting, forestry and fishing

The value of agricultural production corresponds to the difference between gross primary output, calculated on the basis of harvesting, slaughter-house, dairy and milling statistics for quantities produced, and consumption of that output within the sector, multiplied by average prices for the quantities produced. At the same time, the value of agricultural production also comprises the sum of sales, changes in livestock and other stocks, own-account consumption and investment and exports. Data are mainly derived from statistics on the consumption of agricultural products; additional estimates are made for the processing of goods by agricultural enterprises and the production of wines on the basis of flow and stock statistics of the Federal Statistical Office, and brandy production is

estimated on the basis of tax statistics. Business reports of the Federal Monopoly Administration are also used and agricultural services are estimated on the basis of turnover tax statistics.

Inputs correspond to the expenditure of foreign enterprises, which is derived from book-keeping records, foreign trade statistics and production and sales statistics from suppliers of agricultural input goods.

For forestry, including hunting, indicators on quantities of wood felled are available from the quarterly wood-felling statistics, average input prices are estimated from price statistics and additions for hunting are estimated by the Ministry of Agriculture. Output of fishing is estimated by using turnover tax statistics. Input of fishing is estimated from the annual report on fishing in the Federal Republic of Germany and from special studies on the economic situation in deep-sea fishing, issued at irregular intervals.

#### Mining and quarrying

The main sources of information are the censuses of production industries, the latest being for 1967, which provide the bench-mark data, and annual data taken from statistics on turnover data and investment surveys. Data for small enterprises are estimated from a special survey. Data on intermediate consumption are taken from the censuses and cost-structure statistics.

#### Manufacturing

The main sources of information are the censuses of production industries, providing bench-mark data. Annual data are taken from several statistics containing turnover data and investment surveys (including output, stocks and own-account investment); estimates for small enterprises are taken from an industry report for small industrial units.

The censuses also supply information on material inputs, and data on intermediate consumption are taken from cost-structure statistics as well.

In the Federal Republic of Germany craft enterprises are subject to special classifications; censuses are the main sources for bench-mark estimates and turnover statistics and investment surveys provide the chief sources for annual estimates. Craft input is estimated on the basis of censuses and cost-structure statistics.

#### Electricity, gas and water

The main sources of information are the censuses of production industries, which, together with the electricity, gas and water supply censuses (the latest being in 1967), provide the bench-mark estimates. Annual data are taken from statistics on turnover, output, stocks and own-account investment. The censuses provide information on material inputs, but data on intermediate consumption are also taken from cost-structure statistics.

#### Construction

The gross output of construction covers total construction activities carried out by the building industry and building crafts. The main sources for the

bench-mark estimates are censuses (the latest being in 1967) including own-account construction. Annual data are estimated from turnover statistics, annual enterprise surveys of established construction (turnover plus changes in new buildings started and own-account construction) and monthly construction reports (by hours worked). Input is estimated from construction censuses and cost-structure statistics.

#### Wholesale and retail trade, restaurants and hotels

For the wholesale and retail trade the main sources for the bench-mark estimates are the trade censuses of 1967-1969, and output is extrapolated by information from turnover statistics. Input is estimated from trade censuses and cost-structure statistics, supplemented by annual trade reports, which cover purchases and changes in input stocks. These sources are also used for calculating the trade margins.

The sources for estimating the output of restaurants and hotels are the trade censuses (which include hotels and restaurants) and turnover statistics. Their input is estimated on the basis of trade censuses, cost-structure statistics for hotels and restaurants, and company reports.

#### Transport, storage and communication

Data on the German Federal Railways are supplied from the profit-and-loss account of this enterprise. Estimates for other railways are based on cost-structure and turnover tax statistics. Cost-structure statistics are used to estimate parts of output and intermediate consumption for most of the transport subsectors. Turnover tax statistics are used to prepare the current output estimates, supplemented by shipping statistics and foreign currency receipts according to Central Bank data, in the case of shipping, and annual air traffic statistics, statistics for the transport of goods and persons (including receipts) and company reports of transport enterprises. For communication, annual reports of the Federal Post Office are among the basic sources.

#### Financing, insurance, real estate and business services

The banking statistics are collected by the Central Bank and insurance statistics by the Federal Supervisory Board. These statistics provide the basic information for estimating the output of financial institutions, including insurance companies. Input estimates are prepared on the basis of bank company reports collected by the Central Bank and insurance company reports collected by the Central Statistical Office.

Rents are estimated separately for old, more recently constructed and new buildings. They are evaluated from censuses of buildings and dwellings (the latest of which was in 1968), including owner-occupied dwellings and are extrapolated by quantities and prices indexes. Housing input is estimated according to the company reports of a number of building societies and balance-sheet statistics.

Business services estimates are mostly derived from turnover tax statistics or labour market and local unit statistics, statistics on wages and salaries, company reports and cost-structure statistics.

## Community, social and personal services

For producers of government services the contribution to the gross domestic product is given from the cost side, the elements of which are derived from general government receipts and expenditure statistics. In fact, however, several other sources have to be consulted for additional estimates, in particular for capital consumption and statistics on public personnel but also for estimates of income in kind (e.g., clothing issues for the forces).

For private non-profit institutions, output is estimated as the sum of costs for wages and salaries, estimated capital consumption and indirect taxes. Cost structures according to the records of church organizations, labour unions, political parties, and ratios as for local administration form the basis for the input estimates.

Domestic services are estimated from the figures on numbers of employees furnished by population and employment censuses, and corresponding average wages are calculated on the basis of wage statistics and certain estimates.

Education and some other services are estimated by using turnover tax statistics for output. For input in education, cost-structure statistics are used with ratios for comparable expenditure by local administrations on wages and salaries and on goods and services. Reports of broadcasting companies and cinema organizations are used for the information services. For health services, annual book-keeping data of hospitals are used, together with receipts and cost-structure data from doctors' organizations.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Each year the Federal Statistical Office establishes from the relevant records complete accounts of receipts and expenditure for all general government sectors, according to government classifications. As the contents of many items in the basic statistics differ from those used in the national accounts, the Federal Statistical Office analyses and rearranges the data, so that the final consumption expenditure of the different public administration levels can be estimated by separating final consumption components derived from additional sources.

### Private final consumption expenditure

Private consumption expenditure is estimated mainly according to supplying sectors. Data for certain base years are largely derived from censuses, which give data on turnover by kind of purchaser and as input by kind of goods. From these data the part of the total sales by the supplying sector that is purchased by private households can be calculated, as well as the grouping of goods by kinds of use. Annual data are linked with these base-year data by means of current turnover and other supply statistics.

The main statistical sources for that part of private consumption that is supplied by the retail trade include the trade censuses for 1967-1969 and turnover tax and other statistics. Farmer's consumption of their own production is calculated on the basis of statistics on the use of agricultural products. Private consumption supplied by the wholesale trade is mainly based on trade censuses,



which also provide information on purchasers, and is extrapolated by turnover statistics. Estimates of private consumption supplied by crafts are based on the craft census for 1977 and turnover tax statistics, which provide information on the share of households in craft sales. Estimates of private consumption supplied by industry are taken from censuses of industrial production for 1967, with the addition of special statistics or calculations for sales to households. Rents are evaluated on the basis of censuses, according to whether the dwellings are old, of more recent construction or new and also according to various criteria of quality, and are extrapolated by quantity and price indexes. Expenditure on hotels and restaurants is estimated from trade and restaurant censuses for 1967-1969, interpolated and extrapolated by turnover and turnover tax statistics or the number of guests and average prices. Transport expenditure by households is mainly calculated on the basis of statistics of the larger enterprises in this field, e.g. railway fares by category of fares, postal services by category and estimated percentages of fees, plus all receipts for buses, trams etc. For other areas, i.e. non-profit institutions, government, domestic services, insurance and credit institutions and other services, the contribution to gross domestic product is derived from the value-added calculations, from the origin side, according to the kind of service supplied.

Private consumption is also divided into nine categories of use, for which the sources are much the same as those used for the supply sector.

#### Increase in stocks

Book values from balance-sheets, censuses and investment statistics constitute the main sources of information on stock increases. The book values are transformed to constant price values, and only the difference of values at constant prices between the beginning and the end of the period are revalued at average prices. The price levels of the book values are supposed to correspond to the last two to three months in the case of rising prices and to the date of the balance sheet in the case of falling prices.

#### Gross fixed capital formation

The commodity-flow appraisal is the one most frequently used to estimate gross capital formation, while capital formation statistics by investment sectors furnish a supplementary indication of the total value of investment. For commodity flows, the quarterly production report supplies basic data; shares and ratios are developed from a detailed classification, import and export sources, and vehicle production divided by profession of users according to registration statistics. Data on producers of investment goods and other areas are obtained from craft censuses, monthly construction reports, handicraft reports and statistics on building activity.

The following sources are used for the investment sector: for investment in agriculture, forestry and fishing - production statistics (adjusted for exports and imports); for mining and quarrying, manufacturing and construction, and electricity, gas and water - the 1962 and 1967 censuses and annual investment statistics; for transport and communication - the transport census, balance-sheet statistics, company reports and motor-car registrations; for housing - statistics on building activity and construction reports; for public administration - public expenditure statistics (adjusted for timing differences) and construction reports; and for

trade, restaurants and others - trade censuses, current sample surveys by private economic institutes, cost-structure statistics and motor-vehicle registration statistics.

### Exports and imports of goods and services

Foreign trade statistics cover all movements of goods recorded as having crossed the borders with the exception of trade conducted in accordance with the Supplementary Protocol to the Treaty on the Basis of Relations between the Federal Republic of Germany and the German Democratic Republic, and are listed according to the definitions of general trade used for the national accounts. Special statistics cover goods that are exempted from the standard procedure (e.g., defence material); supplementary information on minor items is supplied by the relevant authorities or by following special procedures.

Data on exports and imports of services are obtained from different sources. In principle, all payments for such services should be registered with the Central Bank in its balance of payments. Supplementary data are, however, taken from information collected by other authorities (the Federal Post Office, the Federal Railways, the Ministry of Finance and the Federal Statistical Office).

### Cost structure of the gross domestic product

#### Compensation of employees

Compensation of employees is calculated in three ways, each of which, in principle, serves as a check on the other procedures. The first procedure consists in calculating wages and salaries indirectly from statistics which register fixed percentages of the total values, i.e., from contributions to social security schemes. These contributions are regularly published by the Ministry of Labour, but the parts of incomes exceeding certain income limits have to be computed with the help of income-size distributions derived from tax statistics. For those persons who do not contribute to social security schemes, estimates may be derived either from public expenditure statistics or from statistics on additional wage costs.

The second procedure consists in adding up all available information on wages and salaries by branch of activity and completing the result by estimates for areas not covered. Wages and salaries as bench-mark data for the various branches are included in the censuses (censuses of manufacturing industries, crafts, trade including restaurants, agriculture, electricity, gas and water, and transport); extrapolations and current data are taken from general industry statistics, quarterly earnings statistics, company reports of banks, railways and insurance companies, and post office and government expenditure statistics. The number of wage earners and employees is taken from employment censuses and current statistics. The other elements of compensation of employees are partly available from the same sources and from special statistics on additional wage costs, and partly from sources for other subjects, in which these elements are given only as additional information (e.g., in cost-structure statistics, tax statistics and insurance reports).

The third method of calculation is based on the results of tax statistics. Since these statistics are compiled with a considerable time lag, and only every third year, they serve mainly to check the results obtained by the other two methods.

### Operating surplus

This item is not compiled by adding up components but is derived as a residual in the production accounts.

### Consumption of fixed capital

Capital consumption is calculated according to the perpetual inventory method of all fixed capital formation at constant prices, with a standard survival function the lifetime parameters of which are estimated for 200 classes of investment goods from available sample information and adjusted tax depreciation tables of the Ministry of Finance. Capital consumption is linear; direct information from balance sheets of enterprises is only used for comparison. Capital consumption is calculated at constant prices and at current replacement costs.

### Indirect taxes and subsidies

Indirect taxes and subsidies are taken directly from the general government account.

## Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

Double deflation is used for agriculture; for output the current quantities are valued at base-year prices where information on quantities is available; otherwise the current values are deflated by the relevant index of producer prices. Current input values are deflated by the base-weighted index for purchase prices of agricultural inputs. For forestry and fishing, value added is extrapolated by the quantum index for output, indicators obtained by valuing current quantities at base-year prices.

#### Mining and quarrying

Double deflation is used; output is deflated by an index of producer prices for mining and quarrying and input is deflated by a specially constructed price index.

#### Manufacturing

Double deflation is used; output is deflated by an index of producer prices for industrial products, except for handicraft products and services for which a special price index is applied, and input is deflated by a specially constructed price index.

#### Electricity, gas and water

Double deflation is used; output is deflated by an index of base-weighted producer prices for electric power, gas and water, and input is deflated by a specially constructed price index.

### Construction

Double deflation is used; output is deflated by the available price index for dwelling construction and is supplemented by means of price indexes for various building material outputs, whereas input is deflated by a special price index based on individual series from the index of producers' prices of industrial products.

### Wholesale and retail trade, restaurants and hotels

Double deflation is used; the trade sector sales by commodity groups are deflated by components of wholesale and retail prices, while the ratio between purchases and sales in the base-year is assumed to have remained constant, with adjustments for changes in prices charged by main suppliers. The output of restaurants and hotels is deflated by a specially constructed price index, while the input-output ratio of the base-year is assumed to have remained constant, with adjustments for changes in prices charged by main suppliers.

### Transport, storage and communication

For passenger and goods transport by road and by rail, transportation by pipelines, inland waterway transport and inland harbours, output is extrapolated by quantity indexes of passenger-kilometres and ton-kilometres, prices and tons. The input of railways is deflated by a specially constructed input price index. For seaports, ocean shipping, air transport, storage and services incidental to transportation, output is deflated by specially constructed price indexes. For input (except for railways) the same proportion of output as in the base-year is assumed, with adjustment for changes in prices charged by main suppliers. Double deflation is used for communication; for output, base-year estimates are extrapolated by quantity indicators or current estimates are deflated by the price index for special postal services, and input is deflated by a specially constructed price index.

### Financing, insurance, real estate and business services

For financial institutions and insurance, double deflation is used. As a measure for the real development of the imputed production of bank services, an average of credits and debits deflated by the price index of the latest domestic expenditure is used. The real production value of insurance is extrapolated by indemnities of branches classified by goods that are adequately deflated. The output of rents is deflated by available price indexes for old, new and recently built houses and input is assumed in the same proportion of output as in the base-year. Value added of business services is extrapolated by employment data.

### Community, social and personal services

Double deflation is used; the output of cinemas, advertising on television, laundry services, theatres and private schools are all deflated by specially calculated price indexes for output or labour and material costs, while other items are extrapolated by quantity indexes. Input is assumed to remain in the same proportion of output as in the base-year, with approximate adjustment for changes in prices charged by main suppliers. For producers of government services, wages and salaries are deflated by the index of agreed wages, an adjustment is made for increase in productivity, depreciation is deflated by the price index for corresponding investment goods, and input is deflated by indexes of input prices

related to government expenditure on materials. For producers of private non-profit services to households, value added in the base-year is extrapolated by the number of persons engaged with an addition for increase in productivity.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

Price deflation is used; wages and salaries are deflated by the index of agreed wages, with adjustment made for increase in productivity; purchases for civilian purposes are deflated by the most suitable suppliers' selling price indexes, and to some extent average import price indexes are used for the deflation; purchases for defence purposes are deflated separately, and further divided according to construction, equipment produced in the country, equipment from abroad and other purchases.

##### Private final consumption expenditure

Price deflation is used; for about 60 per cent of the total private consumption expenditure in the domestic market the current values are deflated by means of indexes for selling prices of retail trades; a substantial percentage is deflated by appropriate components of the cost-of-living index.

##### Increase in stocks

Price deflation is used; output stocks are deflated by producers' price indexes, while input stocks are deflated by price indexes calculated according to the type of goods included under intermediate goods and services, on the basis of producers' prices for industrial products and purchasers' prices for foreign goods.

##### Gross fixed capital formation

Price deflation is used; investment in buildings and other construction is deflated by means of prices for individual construction performances, for the industrial assembling of buildings and other construction deflated by the relevant index of producers' prices, and for transport equipment, machinery and equipment deflated in detail by means of individual components of the producers' price index for relevant industries or corresponding indexes of purchasers' prices for foreign goods.

##### Exports and imports of goods and services

Price deflation is used; for merchandise, current values are deflated by specially constructed Paasche price indexes; for exports and imports of services, various price indexes are used for deflation.

## GHANA

The presentation that follows is mainly based on information submitted to the United Nations Statistical Office in 1975 in reply to a questionnaire designed to assess the sources, methods and reliability of national accounts, supplemented by information from the 1971 publication Sources and Methods of Estimation of National Income at Current Prices in Ghana 1/ and from National Accounts of Ghana at Constant Prices, 1965-1968, published in November 1973. 2/ Supplementary information was received from the Central Bureau of Statistics in April 1978.

### Introduction

#### History

National income estimates for the financial year 1930/31 were prepared on the basis of a socio-economic study of the Gold Coast in 1931.

The Office of the Government Statistician in Accra published early estimates for the Gold Coast in 1952, covering the period 1948-1953, in Report on Financial and Physical Problems of Development in the Gold Coast.

The first official national accounts estimates for Ghana were published by the Ministry of Finance in Economic Survey 1957 and covered the period 1950-1957.

In 1971 the Central Bureau of Statistics prepared estimates by industrial origin and in conformity with the concepts and definitions of the new System of National Accounts (present SNA).

#### Approaches used

##### Gross domestic product

The estimation of gross domestic product is largely based on the production approach.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate value added of most industries. The income approach is used for agricultural services, owner-occupied dwellings, insurance and legal services, and for community, social and personal services other than recreational and religious services, trade unions and the Red Cross, for each of which the production approach is used. A combination of the commodity-flow approach and the expenditure approach is used for the construction sector.

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1/ M. S. Singal and J. D. N. Nartey, Sources and Methods of Estimation of National Income at Current Prices in Ghana (Accra, Central Bureau of Statistics, 1971).

2/ National Accounts of Ghana at Constant Prices, 1965-1968 (Accra, Central Bureau of Statistics, 1973).

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, and exports and imports of goods and services. Gross fixed capital formation is estimated by using the commodity-flow approach; increase in stocks is estimated partly by using the commodity-flow approach and partly by using the expenditure approach. Private final consumption expenditure, however, is treated as a residual.

### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

#### Gross domestic product by kind of economic activity

Annual reports of the Ghana Cocoa Marketing Board

Annual sample surveys of agricultural holdings

Annual establishment surveys for mining, large-scale manufacturing, electricity and water supply

Annual reports from Government-owned transport enterprises

Annual accounts of banking institutions

Bench-mark sample survey for road transport

Population census, 1970

#### Cost structure of the gross domestic product

Government accounts

Income-tax records

#### Expenditure on the gross domestic product

Government accounts

Special stock inquiries

Foreign trade statistics

### Methods and sources of estimation

Current prices

#### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

### Agriculture, hunting, forestry and fishing

Cocoa is the most important crop in Ghana, accounting for approximately 10 per cent of the total gross domestic product. It is estimated annually on a census basis through the trade inquiry (Ghana Cocoa Marketing Board) from monthly data on purchases, sales, details and marketing costs etc. Marketing of cocoa is included in the agriculture sector. For other principal crops (maize, guinea corn, millet, rice, yam, ground-nut, cassava, cocoyam and plantain), information is collected through annual sample surveys. The production of a crop is estimated as the product of the area sown and the yield per acre, the latter based on crop-cutting experiments undertaken on a national basis. For the remaining crops the requisite data have been collected through a sample survey in the bench-mark year 1969 only.

The share of livestock is insignificant; no data are collected on the production of milk (which is imported) and wool and animals slaughtered outside the slaughterhouses. The Ministry of Agriculture estimates the number of livestock on a sample basis, and sample surveys of the commercial poultry farms are carried out annually.

Although subsistence farming is more important than commercial farming for several crops in the country, no distinction has been made between the two categories in the estimating process. Own-account production is included in total production. The intermediate consumption of agriculture is estimated on the basis of a small-scale sample survey in 1969 and projected on the basis of movements in acreage and prices of the crops. For fertilizers consumed and machinery hire services, information is provided by the Ministry of Agriculture from annual data. Farm-price data are gathered by the Ministry of Agriculture from the markets during the peak marketing period for each crop, representing national average prices. No deduction is made for the trade margins, however. Suitable adjustments are made to conform to calendar years.

Data on the gross output of forestry and logging are obtained from the Forestry Department, referring to basic data on the various uses (export of logs, timber intake of the sawmills, domestic use of round wood, etc.). In the case of intermediate consumption, a small-scale sample survey has been carried out in the main forest zone in a bench-mark year and constant input ration applied for subsequent years.

For the fishing sector, the data are obtained annually from the Fisheries Department of the Ministry of Agriculture (catch of marine fish) and the Volta River Authority (catch of inland-water fish), based on annual censuses of fishing trawlers and annual sample surveys of small country boats. The cost of repairs, fuels etc. is estimated on the basis of income and expenditure statements of the fishing establishments, prepared for income-tax purposes.

### Mining and quarrying

Annual establishment surveys are undertaken on a census basis for mining, providing both value and quantity data (for a description, see below under, "Manufacturing"). Mining production estimates are cross-checked against export data (for gold, diamonds, etc. with no domestic use) and also certified by the administrative records of the Chief Inspector of Mines (for data relating to physical production).



## Manufacturing

Annual establishment surveys are undertaken on a census basis for large-scale manufacturing, covering establishments that employ 30 or more persons. The survey provides very detailed information on inputs and outputs, detailed enough for commodity-flow purposes, and also data on service inputs as subitems of other production costs.

For small- and medium-scale establishments a sample survey was carried out in 1963 and information from that survey with suitable adjustments, formed the basis for the estimates in the subsequent years (per worker input and output in the bench-mark year and projected employment data, extrapolated from population census data). These data are converted into current-price estimates with the help of manufacturing prices at major group level. The input ratios used are based on bench-mark data.

The traditional sector is very important in the case of manufacturing activity. Information for this sector has been culled from the survey results published in summary form in Area Sample Survey of Small Manufacturing Establishments 1963, an ad hoc publication of the Central Bureau of Statistics. The estimates of output and gross product per person in each of the five industry groups were worked out and used to estimate the 1963 values. For the succeeding years estimates were prepared on the basis of estimated working force and index numbers of wholesale prices for each of the industrial commodities in each group.

## Electricity, gas and water

Annual establishment surveys are also available for electricity and water supply. However, detailed reports on income and expenditure of the enterprises responsible for the public utilities are used to prepare the estimates of value added; these include data on the quantitative output and quantities supplied to the various types of consumer.

## Construction

No detailed survey has been carried out. Data on construction works undertaken by the Government are obtained by analysing the government accounts. The estimate of gross output in construction is prepared by using a combination of the commodity-flow approach and the expenditure approach. It presupposes information on domestic production, imports and exports of construction materials, their utilization rates and trade and transport margins, and also information on the cost-composition of the total expenditure. Index numbers for building costs are obtained from the Public Works Department for this purpose.

## Wholesale and retail trade, restaurants and hotels

The gross margins of the wholesale and retail trade have been established partly on the basis of a purposive sample survey and partly on the basis of spot checks in a bench-mark year. These percentage margins are then adopted for estimates in the subsequent years. Based on commodity flows, the data are classified according to commodity groups covering all wholesalers and retailers irrespective of size (seven distributive trade categories are classified). Intermediate expenses data were collected in the capital city through a small-scale survey in the bench-mark year, with use of constant input-output ratio in the subsequent years.

Data for gross receipts and intermediate consumption for restaurants and hotels are obtained partly from income-tax records and partly through an annual survey with high coverage for organized restaurants and hotels. Allowance is made for non-response, in particular by unorganized small eating and drinking places.

#### Transport, storage and communication

Annual operating records are used for the estimates of rail transport, air transport and water transport services, which are all provided by public corporations. Communication services are also covered by the accounting and operating records of a public corporation.

For road transport, a small-scale survey has been carried out in a bench-mark year, covering trucking and taxi and bus passenger services organized by the private sector (annual operating records are used if the services are provided by the public sector). The number of registered vehicles has been used for making global estimates and also for making projections.

For services allied to transport, the requisite data are collected directly from the enterprises engaged in providing such services, and supplemented by income-tax returns submitted by those firms. Total revenue or income, excluding investment income and other capital gains, is taken as gross output. Current intermediate consumption includes travelling and transport for business, repairs and maintenance of fixed assets, costs of printing and stationery, post and telecommunication, services purchased from other sectors and miscellaneous expenses.

#### Financing, insurance, real estate and business services

The requisite information on financing and insurance is obtained annually, on a census basis, from the financial institutions concerned. Complete information is obtained from the commercial banks, the Central Bank, the savings banks and credit institutions other than the unorganized money-lenders. No information is available from the latter category. In estimating the gross receipts of banks and other financial institutions with demand and time deposits, account is taken of imputed service charges.

The rents for all residential buildings are imputed on the basis of cost components, estimated from the records of the Ministry of Local Government (sample of 22,500 houses during the period 1962-1968). Data on the number of dwellings were based on an inquiry supplementing the population census and extrapolated on the basis of the rate of growth of the population for urban and rural areas separately. Adequate information on intermediate consumption (repairs etc.) is not available, but is arbitrarily assumed to amount on an average to one month's rent.

Annual estimates for business services are based partly on income-tax returns (for accounting and auditing, machinery rental, engineering services) and partly on annual surveys on the number of private legal practitioners and their average income.

#### Community, social and personal services

The role of private services is not very important, as such services are mainly provided by the Government. Educational statistics for 1963/64 form the basis for the education estimates, projected on the basis of informed guesses. The

number of persons engaged in that field is used as an indicator for health services, and the data are obtained from the professional registers. Annual surveys are held for recreational services (cinemas) and special annual inquiries are undertaken with respect to religious services, trade unions and the Red Cross.

The estimates of personal services are mostly based on the population census and are projected on the basis of the growth rate of the working force. For domestic services of households, spot checks on average income per person are also used.

The estimates of value added of producers of government services are compiled by analysing the revenue and expenditure records of the various organs of central Government and local authorities. Gross output is also estimated, and it is feasible to classify wages and salaries and intermediate consumption into kinds of economic activity. Wages and salaries in kind and consumption of fixed capital are included in the value added estimates. The Government's fiscal year differs from the calendar year used in the preparation of national accounts, but in the case of the central Government it is possible to adjust to a calendar-year basis from quarterly data available.

The estimates for producers of non-profit-making services to households are based on annual returns obtained from the enterprises concerned or on an analysis of their accounting records.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

Government consumption expenditure is estimated on a cash basis from government records. It is classified according to government purposes by reclassifying the actual government statements; it is feasible to distinguish clearly between acquisitions for civilian and for military purposes, those for civilian purposes excluding durable goods. Data are available and estimates included for grants of goods and services from foreign countries. The sales of goods and services to the public by the Government are subtracted from the sum of the costs to arrive at government consumption expenditure. The sales data are obtained by analysing the actual revenue accounts.

##### Private final consumption expenditure

Private consumption expenditure is estimated as a residual, obtained from the estimates of gross domestic product from the production less the sum of the estimates of government consumption expenditure, gross capital formation and exports reduced by the estimates of imports from the use side. A national household income and expenditure survey has recently been carried out and will be used to prepare independent estimates.

##### Increase in stocks

The estimates of increase in stocks are mainly based on special inquiries into the stocks held by selected kinds of producers and distributors. The information is complete for cocoa beans, livestock and minerals and for the stocks of commodities held by producers and suppliers of electricity and water. The information available permits a classification by kind of economic activity of the

owners. An adjustment is made to arrive at estimates of the equivalent of physical changes in the stocks, valued at average market prices during the accounting period.

#### Gross fixed capital formation

The estimates of gross fixed capital formation are prepared by using the commodity-flow approach. They are classified according to type of capital goods, but not according to kind of economic activity (see also the description under "Construction" above).

#### Exports and imports of goods and services

The information on merchandise trade is obtained from external trade statistics and supplemented by information from the Central Bank on water and air transport etc., based on foreign exchange records. External trade statistics, which are compiled on the basis of data supplied by the Customs Department, with a few adjustments, provide a comprehensive and detailed source of information for merchandise transactions with the rest of the world.

#### Cost structure of the gross domestic product

##### Domestic factor incomes

This item, which consists of compensation of employees and operating surplus, is arrived at as a residual after subtracting consumption of fixed capital and net indirect taxes from the gross domestic product.

##### Consumption of fixed capital

The perpetual inventory method is used as a basis for the estimation.

##### Indirect taxes and subsidies

These data are obtained by analysing the taxes under the head "Taxes on production and expenditure" in the Government's revenue account. Royalties are, however, regarded as property income. Current grants to Ghana Airways are treated as subsidies from the Government.

#### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Double deflation is used; for output, the current quantities are revalued at base-year prices, for input the base-year figures are kept constant (except for fishing).

##### Mining and quarrying

Double deflation is used; output is valued at average base-year prices and base-year figures are kept constant in estimating intermediate consumption.

## Manufacturing

Double deflation is used; current output estimates at major group levels of ISIC are deflated by corresponding weighted indexes of ex-factory prices, while base-year input figures are kept constant in estimating intermediate consumption.

## Electricity, gas and water

Double deflation is used; the average price charged for each of five consumer groups in the base-year is used for the valuation of quantities of electricity consumed, while the input-output ratio in quantity terms in the base-year is assumed to be constant.

## Construction

Double deflation is used; gross output estimates are deflated by a price index of over-all construction costs, while intermediate consumption is deflated by an over-all price index for construction materials.

## Wholesale and retail trade, restaurants and hotels

For the trade sector, value added is extrapolated by quantity indexes of output for seven different commodity groups. For restaurants and hotels, value added is deflated by specially constructed price indexes.

## Transport, storage and communication

In most cases, value added is extrapolated by a quantity index for output. For services incidental to transport, value added is deflated by an index of earnings per person employed in transport, storage and communication.

## Financing, insurance, real estate and business services

For banks, value added is extrapolated by an index based on the number of cheques cleared etc. and for insurance it is extrapolated by an index of employment. Value added of real estate is deflated by the index number of the rate of interest. For business services, gross output is deflated by price indexes, except that extrapolation by the number of persons engaged is used for legal services.

## Community, social and personal services

Value added for education and recreational services is deflated by the consumer price index, while for other private services value added is extrapolated by the number of persons engaged. For producers of government services, extrapolation by index numbers of employment is also used, for central government and local government separately.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Specific information is not available, but for producers of government services extrapolation by index numbers of employment has been used.

### Private final consumption expenditure

Private final consumption expenditure at constant prices is obtained as a residual.

### Increase in stocks

Except for cocoa, livestock, fish and mineral products, for which current quantitative changes are valued at base-year prices, the value of stock changes is deflated by appropriate price indexes.

### Gross fixed capital formation

For buildings and other construction, current values are deflated by a composite index of construction costs based on input of labour and materials; for transport equipment, machinery and equipment, current values are deflated by the appropriate component of the unit price index of imports.

### Exports and imports of goods and services

In the case of commodity trade, current-price series are deflated by the corresponding Paasche indexes of prices specially prepared for this purpose. The Paasche indexes of prices of exports and imports are estimated by dividing the value indexes by the Laspeyres' indexes of volume of exports and imports. For non-factor services and investment income, use is made of indexes based on exchange rates and the direction of trade of Ghana with her principal trading countries.

## GREECE

The presentation that follows is mainly based on SNA review discussions held with the National Accounts Service of the Ministry of Co-ordination at Athens in October 1977, the report issued by the United Nations Secretariat on country practices in national accounting at constant prices (E/CN.3/464), and supplementary information received from the National Accounts Service in June 1978.

### Introduction

#### History

In 1947 the United Nations Relief and Rehabilitation Administration estimated national income, investments and savings for the year 1938 and balance of payments for the period 1929-1938, and a special commission for surveying national income and investments at the Ministry of Co-ordination estimated national income for the year 1947. Before then, from 1927 to 1939, estimates of national income had been completed by private investigators.

The first official national accounts estimates were published in 1955 by the National Accounts Directorate at the Ministry of Co-ordination, under the title National Accounts of Greece 1946-1953. From 1955 onwards an official publication on national accounts has been issued on an annual basis.

The Ministry of Co-ordination published National Accounts of Greece 1948-1959 in 1961, following a general revision based on a number of censuses and statistical surveys and research carried out by the National Accounts Division.

The Ministry of Co-ordination published National Accounts of Greece 1948-1965 in 1967, with revised estimates for the period 1948-1965, and in 1968 the National Accounts Service, in co-operation with a working party at the Ministry of Co-ordination, compiled an input-output table of the Greek economy for 1958.

In 1972, the National Statistical Service of Greece published National Accounts of Greece, 1948-1970, in which the size of the domestic and national incomes in 1963-1969 was revised in the light of the annual industrial surveys conducted by the Service. In 1973 the National Accounts Directorate General was established within the Ministry of Co-ordination.

National Accounts of Greece, 1958-1975, issued in 1976, contained national accounts for the period 1958-1975, as revised on the basis of recent and more complete primary data.

The publication National Accounts of Greece 1970-1976 inaugurated the presentation of input-output tables of the Greek economy, referring to the years 1958 and 1970, which were incorporated in the national accounting system.

#### Approaches used

##### Gross domestic product

As a rule, the production approach is used to estimate the gross domestic product.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries. The income approach is used for lignite mining, electricity, gas and water works, some sectors of the transportation industry, communication, banking and insurance, public administration and defence, health and education, and miscellaneous services (law services, household services, priests etc.), as well as for income from abroad.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, and exports and imports of goods and services. A combination of the expenditure approach and the commodity-flow approach is used for increase in stocks and gross fixed capital formation. Private final consumption expenditure is now estimated on the basis of the direct expenditure approach and not as a residual.

#### Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

Gross domestic product by kind of economic activity

Annual surveys of agriculture

Annual surveys of industrial establishments

Household budget surveys

Government accounts

Fiscal data

Miscellaneous quantitative information received from the administration

Supplementary surveys conducted by the National Accounts Service

Cost structure of the gross domestic product

Government accounts

Expenditure on the gross domestic product

Government accounts

Annual surveys of industrial establishments

Annual surveys of mining establishments

Licences for private building activity

Agricultural production statistics

Household budget surveys

Tax statistics

Medium-term and long-term loans granted by the Agricultural Bank of  
Greece

Supplementary surveys conducted by the National Accounts Service

Foreign trade statistics

Methods and sources of estimation

Current prices

Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.



### Agriculture, hunting, forestry and fishing

For agricultural and animal breeding the estimate of production is based on annual surveys conducted by the National Statistical Service of Greece. Intermediate consumption estimates are based on data taken from the Agricultural Bank of Greece (fertilizers, fodder, insurances), the Ministry of Agriculture (seeds, fuel), the Public Power Corporation (electric power), etc.

Agricultural product prices are estimated by the Ministry of Agriculture and refer to prices earned by farmers. They include indirect taxes and exclude subsidies given directly to producers. However, for the agricultural income estimate at factor cost indirect taxes are subtracted from these series and subsidies given directly to producers are added to them.

Non-marketed agricultural production is included in the production magnitudes of the annual surveys of agriculture and its valuation is based on prices obtained by the peasants. Because of the method used, it is not possible to estimate separately own-consumption agricultural production.

### Mining and quarrying

Information similar to that mentioned under "Manufacturing" below is available on mining establishments.

### Manufacturing

The estimates are based on the annual survey of industrial establishments, which consists of a census with a detailed questionnaire for large establishments (20 or more employees) and a sample with a more simple questionnaire for small units. The questionnaire includes information on gross output, inputs of goods (not services), wages and salaries, investments and stocks of finished goods and raw materials. This information becomes available within two to three years. Meanwhile, value added is extrapolated by the index of industrial production and the wholesale price index.

### Electricity, gas and water

Value added of electricity and gas production, as well as of water supply, is estimated on the basis of annual questionnaires sent by the National Accounts Service to the Public Water Corporation and the Athens Gas Corporation and to water supply enterprises.

### Construction

The gross value of construction is obtained from investment data on buildings and other construction (land reclamation, roads, ports, bridges etc.). The value of any kind of military construction by the central Government and the value of dwelling repairs, industrial establishment repairs etc. are added to this amount, based on data compiled through household budget surveys and annual industrial surveys, respectively. Intermediate consumption estimates are based on a survey conducted in 1970 for the compilation of the input-output table.

### Wholesale and retail trade, restaurants and hotels

The estimates of gross trade margins for agricultural products are based on traded quantities (by product) valued at the difference between consumers' and producers' prices. For industrial and imported products, percentages of gross trade margins (by categories of product) are applied to the traded values at current prices. The percentages of gross trade margins are based on the current market police orders in force, or on the Service's surveys in the case of goods under no market inspection. Intermediate consumption estimates are based on the survey conducted in 1970 for the compilation of the input-output table.

Restaurants and hotels are included in community, social and personal services.

### Transport, storage and communication

Value-added estimation of railways, water and air transport is based on data compiled through questionnaires sent to the Hellenic Railway Organization, shipowners' enterprises and Olympic Airways. For road transport (buses, trolleybuses and others), data taken from the National Statistical Service of Greece and exploitation agents of transports are used.

The value added of communication is obtained from data compiled through questionnaires sent to the Hellenic Telecommunication Organization and the Hellenic Post Office.

### Financing, insurance, real estate and business services

The value added of financing and insurance is estimated on the basis of annual questionnaires filled in by the enterprises.

For ownership of dwellings, the estimation of real or imputed rents is carried out at constant prices, based on the number of dwelling-rooms and the average annual rent expenditure by room in a bench-mark year. The relative statistics are taken from dwelling censuses and household budget survey data, respectively. The aggregate income of that year is extrapolated by an indicator for the number of dwellings existing at mid-years. The amount for rents, estimated in this way at constant prices, is reflated to current prices by a special consumer price index for rents of dwellings. Expenditure on repairs, insurances etc. is subtracted from this amount.

Business services are included in community, social and personal services.

### Community, social and personal services

Estimates for government services are obtained from general government accounts. For more detail, see under "Government final consumption expenditure" below. For private health and educational services, the only information available is that on wages and salaries.

For hotels, the National Accounts Service conducts a survey every three years, covering all hotels with 100 beds or more and a sample of hotels with less than 100 beds. For restaurants, coffee shops, etc. and laundries, barber's shops, etc., value-added estimation is based on data obtained from household budget surveys, also taking into account expenditure by foreigners. Intermediate consumption

estimates are based on the 1970 survey for the compilation of the input-output table. For other services, employment data are used, as well as data on average remuneration per person employed or data derived from taxation returns.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

General government is divided into central government, local authorities, social insurances and other public funds. The latter include economic units with their own revenue-expenditure budget, e.g., hospitals, educational institutions, social and welfare institutions, chambers, stock markets etc.

Government consumption expenditure is estimated by using the expenditure approach; related data on public employees' wages and salaries, as well as expenditure data on the purchasing of goods and services, are obtained from the accounts of the above government units. These data refer to fiscal years, although they coincide with data for calendar years because extensions in payments to the expenditure for the year may be completed during the first quarter of the next year.

#### Private final consumption expenditure

Two main approaches are used to estimate private final consumption expenditure, the commodity-flow approach and the expenditure approach. In some cases of special items of private consumption expenditures, sources such as household budget surveys (there are basic surveys for the years 1957/58, 1963/64 and 1974), tax statistics and other statistical sources have been used for their estimation.

#### Increase in stocks

Delayed information from the manufacturing and mining surveys is used to supplement the commodity-flow method.

#### Gross fixed capital formation

Estimates of investments in private buildings are based on the building permits that have been issued. No information is available on the relations between the date of issue of the permits, the date of starting and the date of completion, and it is assumed that, with a short time-lag, the permits issued are used during the year to which they refer. The problem is being studied in connexion with the compilation of quarterly national accounts and it is probable that this assumption will be revised.

The sole component for which direct information is generally available is public sector construction, which is derived from government budgetary accounts and replies from public enterprises and public funds. The estimates depend to a large extent on the system of government accounting employed on a cash-payment basis.

The commodity-flow method is mainly used for the estimation of gross fixed capital formation of machinery, transport equipment and other equipment in general. In addition, the expenditure approach is used, based on late information received from the annual manufacturing and mining surveys and information available on investments by large industrial units, public enterprises and public funds,

derived from data collected directly by the National Accounts Service. Both methods are used, whenever possible, to check the accuracy of the estimates. The ultimate allocation is based on the user of capital goods, but in Greece this category conforms fairly well to that of owner of capital goods. No distinction is made between construction in progress and finished construction. Own-account construction is covered by information on loans granted for such construction works (mainly in agriculture).

#### Exports and imports of goods and services

Foreign trade statistics based on the special trade principle are used in the Greek national accounts. It is assumed that the moment of registration of the foreign trade data conforms to the principle of change in ownership used in the national accounts. No correction item has, therefore, been entered in the external transactions table to link the two forms of registration. Greek ships under foreign flags and foreign ships under the Greek flag are not covered in the national accounts, except for incomes that are received by domestic owners and employees. Purchases by ships under foreign flags in Greek ports are considered and estimated as exports.

#### Cost structure of the gross domestic product

##### Compensation of employees

For financing, insurance, the Public Power Corporation, the Hellenic Telecommunication Organization, transport enterprises etc., compensation of employees is estimated by using data derived from questionnaires sent to them by the National Accounts Service.

For manufacturing and mining, use is made of data on the compensation of employees derived from the annual industrial surveys conducted by the National Statistical Service. For public employees, the estimates are based on data derived from central government and public funds accounts. For other sectors, data on employment and average salaries are used, their estimation being based on the ever-binding sectoral labour contracts.

Employers' contributions for all salaried employees are estimated by using data derived from statements of the social insurance funds.

##### Operating surplus

Operating surplus is calculated as a residual.

##### Consumption of fixed capital

The existing estimates of capital stock are calculated according to the perpetual inventory method, mainly for estimating the annual depreciation shown in the national accounts, which is obtained as a percentage of the regularly remaining value of fixed capital.

The bench-mark year for the application of the perpetual inventory method is 1948, the first year in which official estimates of fixed capital investments were made, with fairly satisfactory estimates of the capital stock at the beginning of the same year. The existing figures for capital stock are analysed into 21 industries and for each industry into five types of assets (dwellings, other buildings, other construction and works, transport equipment, machinery and other equipment).

The estimation of capital consumption is done as a percentage of the corresponding capital stock figure for each industry and type of asset separately. The percentages used to reflect the duration of life of the various types of assets are also intended to take into account accidental damage from different causes.

The current-price estimates of capital stock and depreciation are calculated on the basis of replacement cost for the year. This is done by converting the capital stock at the end of the year by the price index of the corresponding capital goods.

#### Indirect taxes and subsidies

The estimates of indirect taxes and subsidies are obtained from the government accounts. No allocation of indirect taxes among sectors or economic activity is available at present. Indirect taxes do include profits of public monopolies.

#### Constant prices

#### Gross domestic product by kind of economic activity

##### Agriculture, hunting, forestry and fishing

Double deflation is used; current quantities of both output and input are valued at base-year prices.

##### Mining and quarrying

See under "Manufacturing" below.

##### Manufacturing

Price deflation is used; value added is deflated by the price index of domestic mining and manufacturing goods, mainly based on prices collected for the compilation of the wholesale price index. If data from annual statistical surveys are not yet available, value added is extrapolated by quantity indicators for output based on the index of industrial production.

##### Electricity, gas and water

Double deflation is used for electricity and, for water supply, base-year values are extrapolated by indicators of gross output.

## Construction

Value added is extrapolated by volume indicators for output, based on expenditure on construction and repairs expressed at constant prices by using specially constructed price indexes.

## Wholesale and retail trade, restaurants and hotels

Gross output at constant prices of goods produced and traded in the domestic market is estimated from various sources and totalled. An estimated percentage is applied to this total in order to arrive at total trade margins at constant prices. Value added originating in import and export trade is deflated by the unit value indexes for imports and exports, respectively.

## Transport, storage and communication

Value added is extrapolated by quantity indicators for output based on passenger-kilometres and ton-kilometres, the number of letters and parcels delivered, telephone calls made and telegrams sent.

## Financing, insurance, real estate and business services

For financial institutions and insurance, wages and salaries are deflated on the basis of the annual wage rate increases. Non-labour income is deflated by the consumer price index. For ownership of dwellings, see the methods used to estimate rents of dwellings in the section on current prices.

## Community, social and personal services

For private services, the estimates at current prices are deflated by the consumer price index. For hotels, however, value added of the base-year is extrapolated by quantity indicators for receipts based on the nights spent in hotels multiplied by the average charge per night for the base-year. For government services, see under "Government final consumption expenditure" below.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Total basic wages are estimated for each category of employee from data on the number of public employees serving in different parts of Government, classified by rank, and from data on their basic wages for the base year and the current year. Price indexes by categories of public employees are obtained from the aggregates at current and constant prices, used to deflate the total of wages and salaries, excluding the allowances on food and clothing given to military men which are deflated by the corresponding special consumer price indexes. The component goods and services (32 groups) are estimated at base-year prices by using special price indexes corresponding to them, e.g. price indexes for fuels, rents, printing materials, telecommunication, medicines, construction etc.

### Private final consumption expenditure

For food, fuel and light and water charges, annual quantities of each commodity are multiplied by average base-year prices. Current estimates are deflated by the appropriate components of the consumer price index for clothing and footwear, gross rent, furniture, furnishing and household equipment, household operation, medical care and health expenditure, transport and communication, recreation, entertainment and cultural services. Lastly, expenditure on other goods and services is deflated by the general consumer price index.

### Increase in stocks

For all goods for which stock changes can be measured in quantity terms, the volume changes are estimated valuing these quantities by the average prices of each major commodity involved in the base-year; otherwise, the value of change in stocks at current prices is deflated by appropriate sections of the wholesale price index.

### Gross fixed capital formation

For dwellings and non-residential buildings, the estimated volume of dwellings is multiplied by average prices per cubic metre in the base year, separating the greater Athens area from the rest of the country. From 1964 onwards, the annual current-price estimates have been deflated by a special price index of dwellings constructed by the Price Committee of the Ministry of Public Works. For other construction and works, current estimates are deflated by a price index referring to certain types of construction activity for which there are separate price indexes compiled by the Price Committee. Annual quantities of machinery and transport equipment, classified by major categories, are multiplied by the corresponding average c.i.f. prices in the base-year. Then the additional estimated current value up to the final user of capital goods is deflated by the consumer price index. From 1971 onwards the annual current estimates in c.i.f. values have been deflated by the appropriate mean value index of imports compiled by the National Statistical Service. For shipping, the current-price magnitudes are deflated by a freight index. For other equipment, the current-price estimates are deflated by appropriate sections of the wholesale price index prepared by the National Statistical Service.

### Exports and imports of goods and services

The base-year values of exports and imports of merchandise are extrapolated by volume indexes, while the magnitudes of other goods and services are deflated by the mean value index of exports and imports.

## HONDURAS

The presentation that follows is mainly based on the detailed description of sources and methods in "Metodología de cuentas nacionales de los países centroamericanos", issued by the Consejo Monetario Centroamericano, in October 1976. Other sources include the report by the United Nations Secretariat entitled "Country practices in national accounting at constant prices (E/CN.3 464) and supplementary information received from the Banco Central de Honduras in September 1978.

### Introduction

#### History

National accounting work on a systematic basis began in 1950, when the Banco Central de Honduras undertook, with the co-operation of the Banco Nacional de Fomento, the task of building up series of economic statistics within the framework of the National Income Project.

A national accounts section was created in the Banco Central de Honduras, which issued its first publication, Economic Series, in 1952.

In 1954, in the study Estadísticas del Producto e Ingreso Nacional, 1925-1952, the Banco Central de Honduras published national accounts estimates going back to 1925.

Official estimates, accompanied by a description of the methods used, were published in 1974 by the Banco Central de Honduras in Producto e Ingreso Nacional 1960-1972.

In 1977 official and revised estimates, including a methodological description, were published in Cuentas Nacionales de Honduras, 1960-1975.

#### Approaches used

##### Gross domestic product

Generally the production approach is used to estimate the gross domestic product.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate the value added of most industries. The income approach is used to estimate the value added of producers of government services, part of the transport sectors and other private services.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, and exports and imports of goods and services. The commodity-flow approach is used for private final consumption expenditure and most gross capital formation.



## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Agricultural statistics (censuses, surveys and samples)

Industrial statistics (censuses, surveys and samples)

Foreign trade statistics

Government accounts

Population censuses

### Cost structure of the gross domestic product

Industrial statistics (censuses, surveys and samples)

Government accounts

Income-tax statistics

### Expenditure on the gross domestic product

Government accounts

Foreign trade statistics

Sample building surveys

## Methods and sources of estimation

### Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

### Agriculture, hunting, forestry and fishing

For agricultural crop production, information on the gross domestic product is obtained directly from the most important export enterprises, and for other products the estimation is made on the basis of per capita consumption data adjusted for exports and imports; surveys are conducted to obtain information on the basic production of grains. Prices are available from different sources, and intermediate consumption is estimated by using a coefficient by product, obtained from agricultural credit data and special studies conducted by the Dirección de Desarrollo Rural. Agricultural censuses were held in 1953, 1965 and 1974.

For coffee, complete information, including production volume, inputs and producer and export prices, is obtained from the Instituto Hondureño del Café. At present, production data for maize, rice, beans and other crops are obtained from the annual surveys conducted by the Dirección General de Estadística. For banana production the banana companies in the northern zone are visited annually, and value added is estimated by using the income approach. For the rest of the country per capita consumption data are taken into account, together with prices collected from native producers. Annual information on sugar-cane is available directly from the sugar enterprises. For fruits and vegetables, however, the estimates have to be based on per capita consumption data, and multiplied by annual population data, adding exports and excluding imports, valued by producers' prices.

For livestock, information on production is gathered from the major producers by the Dirección General de Estadística, the Dirección General de Caza y Pesca and the Dirección General de Ganadería. Some information is also obtained from meat packers. Adjustments are made for clandestine or uncontrolled transactions. Livestock changes are estimated on the basis of the annual birth, death and culling rates. Producer prices are used for the marketed part of production. Inputs are estimated as 30 per cent of the gross value of production, based on the opinion of experts from the Dirección General de Ganadería and from the livestock project. Milk production is estimated from consumption data, adding milk as an input of industrial production. Human consumption per capita has been estimated from the family budget surveys conducted in 1967 and 1968.

In general, the estimates for forestry are based on basic studies on physical production and prices. The production is calculated as a function of household and industrial consumption of firewood, and extrapolated by an index similar to the index of population growth. From 1974 figures are available from the Corporación Hondureña de Desarrollo Forestal, which controls the national production of this activity.

For fishing the estimates are calculated on the basis of information from the Dirección General de Pesca, which controls the production, and supplementary data from foreign trade statistics and per capita consumption data. The prices used are derived from export data and information obtained by the Banco Central de Honduras.

### Mining and quarrying

For metal mining the statistical information is obtained directly, while the estimates for non-metallic minerals are based on inputs used in the construction sector, using certain coefficients derived from an analysis of construction costs. The production of salt is estimated from per capita consumption data. In estimating value added, factor remuneration data are available from metal mining enterprises, while coefficients are used for other enterprises, based on surveys and studies of salt-dealers in the south and construction enterprises carried out by the Banco Central.

### Manufacturing

The estimates are based on censuses, surveys and sample data provided by the Dirección General de Industrias and the Departamento de Estudios Industriales. Profit-and-loss statements are also available for some enterprises. In order to estimate the artisan sector, population growth data are used at the product level, for which an assumption is made of the numbers employed.

### Electricity, gas and water

Information is obtained directly from the Empresa Nacional de Energía Eléctrica, the Accountant-General of Honduras, the banana industry, the municipalities and the Servicio Nacional de Acueductos y Alcantarillados. The data available cover gross values of production, aggregated values, physical production, installed capacity and personal occupation.

### Construction

Information on public construction is taken from direct sources, i.e., the Contaduría General de la República, the Asesoría Técnica de Municipalidades, the Municipalidad de la Ceiba, the Consejo del Distrito Central and the Municipalidad de San Pedro Sula.

With the information obtained from the municipalities (authorizations issued, etc.), a sample is taken from which the growth of private construction can be measured, providing a basis for the estimation of gross output, inputs and value added by type. The population and housing censuses are also taken into account for dwellings.

### Wholesale and retail trade, restaurants and hotels

For the trade sector, the estimates are based on the gross value of agricultural production by item and the gross value of industrial production by item; the value of imports and exports are estimated from the foreign trade statistics, and information received from the Dirección de Tributación Directa and commercial establishments. Products that do not enter the trade channel are subtracted. The aggregate for gross trade margin is obtained from the Dirección de Tributación Directa. Value added is estimated on the basis of a survey conducted for this sector, establishing specific coefficients.

Restaurants and hotels are included in community, social and personal services.

### Transport, storage and communication

This sector covers all the basic information needed for the estimation of railways, air transport, ports and communication. In estimating road transport, information on registered vehicles for rental is used. These direct surveys provide data on income and expenditure by type of vehicle, depreciation and profits. Value added is derived by adding together the income components (wages, depreciation and profits).

### Financing, insurance, real estate and business services

Information for financial institutions is obtained from the Superintendencia de Bancos, which provides financial statements for all banks in the system and insurance companies. No estimates are made for real-estate agents.

The estimates of ownership of dwellings are based on census information for 1949, 1961 and 1974, covering the number of dwellings and the average rents paid and imputed. In order to arrive at the value added, inputs in the form of maintenance, insurance, etc. are deducted.

### Community, social and personal services

For producers of government services the information is obtained directly from the Contaduría General de la Nación and from the Asesoría Técnica Municipal. The estimates are prepared by type of expenditure, kind of economic activity and functional classes (purposes). Activities such as transport, communication, education and health are classified under the respective industries.

For estimating private services, use is made of employment data, classified by type of service rendered, and data on average wages and salaries from other information sources. This type of data covers all educational levels, for medical services the number of professionals and data for total wages paid by the State are supplemented by other quantitative information (the number of hospital beds, etc.). Estimates for amusement are based on taxes on tickets. For domestic services, data on employment and wages are also the basis for estimating the value added, but 75 per cent is added to the cash figures for board and lodging as wages and salaries in kind.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

This item is estimated on the basis of the settlement of government accounts, classified in line with the recommendations of the United Nations and covering wages and salaries of general government, purchases of goods and services, and also the depreciation of fixed assets except for roads and bridges.

#### Private final consumption expenditure

Private final consumption expenditure is estimated as a residual.

#### Increase in stocks

Included in the estimates are data obtained from the banana industry, the mines, the public sector, BANAFOM, the Instituto Nacional del Café, the Dirección General de Industrias, the petroleum sector, the Corporación Hondureña de Desarrollo Forestal, information on livestock and information derived from a sample of the trade enterprises.

#### Gross fixed capital formation

Private investment consists of the gross value of production in the construction sector, plus imports and domestic production of capital goods, which are adjusted to purchasers' values. Public investment is estimated from public sector data on settlements by type of construction and classes of machinery and equipment.

#### Exports and imports of goods and services

In general, the estimates are based on balance-of-payments data. Export and import statistics are adjusted for national accounting purposes (reclassification).

## Cost structure of the gross domestic product

### Compensation of employees

Estimates of labour income are derived from the basic statistics already mentioned, supplemented by information on wages and salaries paid by the various government agencies and other public bodies.

### Operating surplus

Estimates of profits of enterprises and professional incomes are obtained from the Dirección General del Impuesto sobre la Renta. Estimates of interest and dividend payments received by households and private non-profit institutions are derived as a residual.

### Consumption of fixed capital

No specific information is available.

### Indirect taxes and subsidies

Indirect taxes and subsidies are estimated on the basis of government sources.

## Constant prices

## Gross domestic product by kind of economic activity

### Agriculture, hunting, forestry and fishing

Value added of agriculture, forestry and fishing is either extrapolated by quantity indexes for output or deflated by price indexes (coffee, etc.).

### Mining and quarrying

Value added is extrapolated by quantity index for output.

### Manufacturing

Value added is extrapolated by a quantity index for output or a quantity index for inputs.

### Electricity, gas and water

Value added is extrapolated by a quantity index for output.

### Construction

Current values are deflated by indexes of wages and salaries.

### Wholesale and retail trade, restaurants and hotels

Current values of marketed imports are deflated by a unit value index of imports used as indicator of value added. For all other items value added is extrapolated by a quantity index of marketed production.

### Transport, storage and communication

For transport and storage, value added is extrapolated by quantity indexes for services rendered, except for ocean and inland waterway transport, which is extrapolated by a quantity index for exports. For communication, value added is deflated by an index of wages and salaries.

### Financing, insurance, real estate and business services

For financial institutions and insurance, value added is extrapolated by the number of persons engaged. For real estate and business services, value added is extrapolated by a quantity index of output.

### Community, social and personal services

Value added is deflated by an index of wages and salaries for producers of government services, including public education and health services. For private services, value added is extrapolated by the number of persons engaged, the number of doctors and the number of attendants.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

Wages and salaries are deflated by an index of wages and salaries; purchases of goods and services are deflated by the cost-of-living index.

#### Private final consumption expenditure

This item is estimated as a residual.

#### Increase in stocks

Price deflation is used; the current value is deflated by the unit value index for imports.

#### Gross fixed capital formation

For buildings and other construction, the current values are deflated by indexes of wages and salaries; for transport equipment, machinery and other equipment, they are deflated by unit-value indexes for imports.

#### Exports and imports of goods and services

Price deflation is used; current values are deflated by unit-value indexes for total exports and for total imports in the case of merchandise, and by the cost-of-living index in the case of other goods and services.

## HONG KONG

The presentation that follows is mainly based on information contained in the latest editions of Estimates of Gross Domestic Product, published by the Census and Statistics Department, Hong Kong, in 1976 and 1977. Supplementary information was received from Hong Kong through the Ministry of Overseas Development, London, in December 1977.

### Introduction

#### History

A project to conduct a survey of the national income of Hong Kong was initiated in 1962 at the request of the Government of Hong Kong.

In 1965 preliminary estimates of some of the basic national income aggregates were presented to the Government.

A national income section was set up in the Census and Statistics Department in 1971.

The first publication in the series Estimates of Gross Domestic Product was issued by the Census and Statistics Department in 1973, covering the period 1966-1971.

#### Approaches used

##### Gross domestic product

The main approach used to estimate the gross domestic product is the expenditure approach.

##### Gross domestic product by kind of economic activity

Estimates of the contribution by economic sectors to the gross domestic product were not published until very recently; the first attempts were based on the income approach, supplemented by the production approach for some industries, including the industrial sectors. It is necessary to await the results of surveys undertaken as a follow-up to the 1973 industrial production census and further economic censuses before a sound analysis based on the latter approach can be confidently provided.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure and exports and imports of goods and services. The commodity-flow approach has generally been used for private final consumption expenditure and gross fixed capital formation, supplemented by the expenditure approach.

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

(This table is still provided as a check only.)

### Cost structure of the gross domestic product

Income-tax statistics

Wage surveys

Annual reports of the Department of Agriculture and Fisheries

Population census, 1971

Government reports

### Expenditure on the gross domestic product

Government reports

External trade statistics

Household expenditure surveys

Census of manufacturing establishments, 1970

Returns on the cost of construction of buildings etc.

## Methods and sources of estimation

Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at factor costs, included in the United Nations Yearbook of National Accounts Statistics for the first time in its 1976 edition. <sup>1/</sup>

In an appendix to the series Estimates of Gross Domestic Product, estimates of gross domestic product by industrial origin have been published for the years 1970-1974 inclusive. These estimates are made by using the income approach, with

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<sup>1/</sup> Yearbook of National Accounts Statistics, 1976 (United Nations publication, Sales No. E.77.XVII.2).



the intention of making an independent check of the order of magnitude of the expenditure estimates. The Census and Statistics Department intends to improve these income estimates, with a view to publishing them yearly together with the expenditure estimates. On the other hand, in order to evaluate the accuracy of the expenditure estimates, an exercise was carried out to compile a "commodity-flow" table for 1973, showing the sources of all commodities as well as their uses. The commodity-flow estimates of this table have been based on information used in the present estimates of gross domestic product, and results from the 1973 census of industrial production, as well as other information from ad hoc surveys and special exercises carried out by the Department.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

Government consumption data are obtained from the annual reports of the Accountant-General, providing the actual expenditure of each department by financial year, ending on 31 March. Since 1973, quarterly figures have been provided by the Treasury and adjustment to the calendar year is no longer required.

The estimates, which are classified into compensation of employees and purchases of goods and services, relate to current expenditure on goods and services by government departments not engaged in trading activities, the latter comprising the Kowloon-Canton Railway, the Post Office, the Resettlement Department and Housing Department and certain sections of the Public Works Department. The value of sales of goods and services to households and enterprises by non-trading departments is deducted from the value of purchases of goods and services.

##### Private final consumption expenditure

In general, the commodity-flow method has been used where appropriate. Trade statistics of retained imports are supported and complemented by data from the household expenditure surveys, the 1970 census of manufacturing establishments, sample surveys on sales of business establishments, administrative statistics and other sources, including informed guesses. Use of the commodity-flow method is principally dictated by the fact that a large proportion of the commodities included in private consumption expenditure is imported, covered by adequate and detailed trade statistics. Commodities produced domestically for local consumption are mainly food-stuffs, for which the annual output is regularly made known by the Agriculture and Fisheries Department and the other government departments concerned. The latest household expenditure survey was conducted in 1973/74 and the results have been reflected in the estimates.

Imported and domestically produced commodities are reported in importers' and wholesalers' values, respectively, and the retail value has been arrived at by adding transport expenses and distributors' profit margin. In general, a flat 30 per cent of the retained import value is added for imported goods, while domestically produced goods are marked up 15 per cent, although in certain cases arising from the results of the census of manufacturing establishment the mark-up is 30 per cent. Consumer goods and services have been classified into 83 groups.

### Increase in stocks

The estimates refer to increase in stocks of materials and supplies, work in progress and finished goods held by industries, stocks of intermediate goods held by wholesalers and retailers and stocks of hydrocarbon oils held by importers. By virtue of the methods adopted for the estimation of private consumption expenditure and gross domestic fixed capital formation, the changes in stocks of consumer goods and capital goods held by wholesalers and retailers have been included implicitly in these estimates and are not included here.

An attempt has recently been made to obtain estimates for this component through a survey of establishments. Information on quantities of hydrocarbon oils kept in stock by oil companies are obtained from the Commerce and Industry Department. Increases in stocks of intermediate goods held by wholesalers and retailers are still not estimated because of a lack of data.

An adjustment for stock appreciation has been incorporated. Estimates of increases in stocks have been made for 1973 onwards.

### Gross fixed capital formation

The commodity-flow approach has generally been used. Investment in plant, machinery and equipment is mainly based on the value of retained imports of capital goods, adding a flat 30 per cent to this value to allow for dealers' profits, transport and assembly charges, installation and other expenses. An estimate of domestically manufactured plant, machinery and equipment purchased locally has been calculated from the results of the 1970 census of manufacturing establishments and projected by the number of employees engaged.

Private sector investment in new buildings and construction is based on the Building Ordinance Office's monthly statistical returns on the cost of construction of newly completed buildings and construction for which occupation permits are issued, but some adjustments and supplements are needed. Investment in the government sector is obtained from an analysis of the accounts of government departments. Expenditure on land has been calculated as the sum of stamp duty collected by the Government and legal fee charges based on the number of instruments registered in a year and the average rates charged.

### Exports and imports of goods and services

Exports of merchandise cover total values of domestic exports and re-exports on an f.o.b. value basis, obtained from detailed external trade statistics. For travel, surveys conducted by the Hong Kong Tourist Association provide the main source of data. Port and airport charges and other such revenue are obtained from government accounts, while expenditure of foreign crews is estimated from the number of ocean-going vessels entering Hong Kong waters, the estimated size of crew carried by each vessel and estimated expenditure by each crew member. Expenditure by non-residents in the domestic market, amounting to more than 10 per cent of total private consumption expenditure, is estimated from the results of surveys conducted by the Hong Kong Tourist Association.

Imports of merchandise cover total values of imports of goods on a c.i.f. value basis, including a percentage of retained import transactions in non-monetary gold and current coins. An adjustment is made for the water imported from China (not included in trade statistics). Imports under the items of travel and transportation are based on statistics supplied by the Hong Kong Tourist Association and certain assumptions on growth rates. Other imports are partly derived from the accounts of government departments.

### Cost structure of the gross domestic product

#### Compensation of employees

The statistical information on wages and salaries is obtained from a number of sources. The main ones are wage surveys conducted by the Census and Statistics Department, the Hong Kong Productivity Centre, the Agriculture and Fisheries Department and official publications. For each kind of economic category except the agriculture and fishing sector, information is sought on wages and salaries, including bonuses, income in kind, subsidized housing and overtime. For each category the number of employees is multiplied by the estimated average annual income to give the total wage and salary bill. In case a category includes many different skills, every effort is made to obtain earnings data for a broad range of skills. The wage and salary bill for each category or subcategory is added to give the total wage and salary bill for the economy. For the agriculture and fishing sector the estimation is now based on the total value of production published in the Agriculture and Fisheries Department's annual reports, as well as a breakdown of the total value of production by compensation of employees, operating surplus and intermediate inputs provided by that Department. The numbers of employees and self-employed in 1971 by sex, main industrial sector and main occupation group are available from the 1971 Hong Kong population census.

#### Operating surplus

The estimates of operating surplus are based on up-to-date tax statistics provided by the Inland Revenue Department. When calculating profits from tax assessments, a lag of one year has been assumed, but no such adjustment is made for interest and property income.

#### Consumption of fixed capital

No separate estimate on depreciation has been made, as the depreciation allowance given for tax purposes is too different from the concept of consumption of capital to be used in national accounting.

#### Indirect taxes and subsidies

The estimates for indirect taxes, net, are based on information obtained from the annual reports of the Accountant-General or directly from the Treasury.

### Constant prices

#### Gross domestic product by kind of economic activity

Gross domestic product by kind of economic activity at constant prices is not estimated.

## Expenditure on the gross domestic product

### Government final consumption expenditure

Compensation of employees is deflated by a specially constructed salary rate index for government employees based on the mid-point salary of each grade in the civil service; purchases of goods and services are deflated by a specially constructed price index for government purchases of goods and services calculated from government purchase records, and a specially constructed index is also used to deflate sales by Government to households and enterprises.

### Private final consumption expenditure

The current values are deflated by consumer price indexes at group level or revalued at base-year prices. Expenditure of private non-profit-making bodies is deflated by the salary rate index for government employees, expenditure abroad by residents is revalued on the basis of estimated per capita expenditure by residents abroad in 1966, while expenditure by non-residents in Hong Kong is deflated by a tourist price index compiled by the Hong Kong Tourist Association.

### Increase in stocks

A special index is constructed based on unit value indexes of imports of raw material (representing raw materials and supplies) and domestic exports (representing goods on hand for sale).

### Gross fixed capital formation

For building and construction, current values are deflated by a cost index of building and construction prepared by Public Works Department. For plant, machinery and equipment, current values are deflated by an index of unit values of imported capital goods, while expenditure on legal fees is revalued at base-year prices (for land).

### Exports and imports of goods and services

For domestic exports and imports of merchandise, the current values are deflated by an over-all index of unit values of exports and imports compiled by the Census and Statistics Department, for re-exports they are deflated by an over-all index of unit values of imports, for travel they are deflated by a tourist price index, for port and airport charges and communications they are deflated by indexes of the rates charged, expenditure abroad of overseas offices is deflated by a combined consumer price index of selected countries, and other items are revalued at base-year prices.

## INDIA

The presentation that follows is mainly based on the detailed and comprehensive information received from the Central Statistical Organisation in September 1978. Other publications of the Central Statistical Organisation used as sources include a Brochure on Revised Series of National Product for 1960-61 to 1964-65, published in 1967, National Income Statistics-Estimates of Capital Formation in India 1960-61 to 1965-66 and National Accounts Statistics 1960-61 to 1974-75 published in 1969 and 1976, respectively. Information has also been taken from the report prepared by the United Nations Secretariat entitled "Country practices in national accounting at constant prices" (E/CN.3/464).

### Introduction

#### History

The first estimate of national income for India was prepared by Dadabhai Naoroji for the year 1867/68 and published in 1871 in Poverty and Un-British Rule in India.

In 1948 official estimates of national income were prepared for the first time by the Central Ministry of Commerce, covering the years 1945/46 to 1947/48.

In 1954 the National Income Committee's final report was released, containing estimates of national income at current and constant prices, concepts, source material, methodology used and recommendations for improvements in basic statistics.

In 1956 the Central Statistical Organisation released its first "White Paper", containing estimates of the national income and the accounts of the public sector.

In 1967 the Central Statistical Organisation published the Brochure on Revised Series of National Product for 1960-61 to 1964-65, which, besides presenting revised series and shifting the base year to 1960/61, described in detail the methodology followed.

The first estimates made in accordance with the present SNA were published in 1971 in Estimates of National Product 1960-61 to 1969-70.

Details of outputs and inputs and value added by sectors were published for the first time in 1975 in a brochure entitled National Accounts Statistics 1960-61 to 1972-73 - Disaggregated Tables. Estimates of private consumption expenditure at current and constant prices were first published in the National Accounts Statistics for 1975 and a breakdown of domestic product according to factor incomes was given in the National Accounts Statistics for 1976.

In 1978 an interindustry transaction table consistent with the national accounts statistics, covering 60 major industry groups, was given for the first time in the National Accounts Statistics for 1978.

## Approaches used

### Gross domestic product

As a general rule the production approach is used to estimate the gross domestic product.

### Gross domestic product by kind of economic activity

The production approach is used to estimate value added for all commodity-producing sectors, ownership of dwellings, cold storage and bench-marks for small-scale manufacturing. The value added of construction is based on a combination of the commodity-flow approach and the expenditure approach. The income approach is used for the other sectors, including bench-marks for wholesale and retail trade, restaurants and hotels.

### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure, increase in stocks, and exports and imports of goods and services. The commodity-flow approach is adopted for the estimation of private final consumption expenditure, whereas the estimate of gross fixed capital formation is based on a combination of the commodity-flow approach and the expenditure approach.

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Area and production statistics of principal crops

Marketing reports on rice, wheat, livestock products, etc.

Reports of farm management and cost of cultivation studies

Quinquennial livestock censuses

Reports of the Indian Bureau of Mines

Annual surveys of industries

Customs and excise revenue statements of the Indian Union

Monthly statistics of foreign trade

Annual reports of electricity supply enterprises

Annual reports of central government departments

Annual reports of transport concerns

Statistical tables relating to banks

Annual reports of life insurance and general insurance corporations

Returns on the number of houses, assessed rental, etc. from the municipalities

Decennial censuses of population

Reports of national sample surveys

Reports of ad hoc surveys and censuses, such as the debt and investment surveys of the Reserve Bank of India, distributive trade surveys, the census of small-scale industries, etc.

Budgets and accounts of the central Government, state governments and local bodies

Accounts of public and private enterprises

All-India income-tax statistics

Wage statistics of rural workers

Cost structure of the gross domestic product

See above

Expenditure on the gross domestic product

Budgets and accounts of the central Government, state governments and local bodies

Accounts of public and private enterprises

Reports of the debt and investment surveys of the Reserve Bank of India

Reports of national sample surveys

Studies on company finances by the Reserve Bank of India

Annual surveys of industries

Monthly statistics of foreign trade

Customs and excise revenue statistics of the Indian Union

Balance-of-payments statistics

## Methods and sources of estimation

### Current prices

#### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared in factor values.

#### Agriculture, hunting, forestry and fishing

The production estimates of 36 principal agricultural crops are based on results of the random sample crop-cutting surveys conducted by the respective state government agencies, regularly published by the Directorate of Economics and Statistics in the Ministry of Agriculture and Irrigation. The estimates of production of nine minor crops are ad hoc in character, as no objective surveys are conducted to estimate their yield rates. For citrus fruits, grapes and mangoes, however, yield rates are taken from the relevant marketing reports and area figures obtained from the Directorate. A similar method is used for the 11 miscellaneous and unspecified crop groups for which out-turn figures are not available. The estimates of out-turn for 12 other products and by-products have been formed by using relevant statistical source material available from the state governments.

Data on wholesale prices in the primary markets, assumed to approximate producer prices, are mostly obtained from the published reports or unpublished records of the state governments and the Directorate. A simple average of the prices prevailing in the various centres within a district over the peak marketing period is taken to represent the district average price, which is then weighted properly to give the average price of a commodity in the state. These prices are used to evaluate the total production of each commodity in the state.

From the total gross value of output so obtained, necessary deductions are made for foodgrains procured by the Government at prices lower than the market prices, and for the value added of the rice-milling industry. The gross product from the operation of government irrigation systems is estimated using the income approach, by information culled from the budget documents of the state governments and the central Government.

The annual estimates of livestock products for the various states are based on the livestock population by type and the corresponding average yield rates. The number of animals is obtained by interpolation or extrapolation of data from the quinquennial livestock censuses (latest census in 1972), and the corresponding average yield rates are based on the results of marketing reports, data from the Ministry of Agriculture and Irrigation and ad hoc surveys conducted by the Indian Agricultural Statistics Research Institute. These output estimates are evaluated using the corresponding average annual wholesale prices duly adjusted for trade and transport margins (and rural/urban differentials if necessary).

The gross value of output of hunting and trapping is estimated on the basis of partial data available on the number of animals killed or caught by important species and approximate prices of different kinds of fur.



Estimates of intermediate consumption are prepared for the combined activities of agriculture, livestock and hunting. For most principal crops and some minor crops, data on the quantity of seed required per area unit sown are obtained from the state governments, supplemented by seed rates data from marketing reports and a national sample survey report. The estimates of the value of organic manure are prepared by using data from the farm management reports and the reports on the cost of cultivation studies. Data on the actual physical quantity and prices of chemical fertilizers, available from the Fertiliser Association of India, are used to prepare the estimates of input of inorganic manure. The cost of feed for livestock is estimated on the basis of details of total feed availability. Other inputs, such as electricity, pesticides, insecticides, diesel oil, irrigation charges, etc. are also estimated by using a variety of sources and methods. The cost of repairs and the maintenance of agricultural implements and machinery, bullock carts, farm structures, etc. is estimated on the basis of results of the all-India rural debt and investment survey and reports of the Indian livestock census, both extrapolated by suitable indicators.

For forestry, annual data on the output of industrial and fuel wood are available from a brochure entitled Forestry in India. Wholesale price data at assembling centres are obtained directly from the State Chief Conservators of Forests. These prices are reduced by 25 per cent to eliminate trade and transport margins. An allowance of 10 per cent of the value of recorded production is made to cover the unrecorded production. For minor forest products, output data are not available; instead, estimates of royalty values are obtained from the State Chief Conservators of Forests and adjusted suitably to arrive at the economic value. The value of own consumption has also been included in total output. Inputs are estimated as 4 per cent of the gross value of output, based on limited information available for forests under public ownership.

The estimates for the fishing sector are based on the catch of marine and commercial inland water fish, supplied by the Central Marine Fisheries Research Institute and the State Fishery Departments, respectively, and the wholesale prices of marine and inland fish, supplied by the State Fishery Departments. The value of fish caught by non-professional fishermen is estimated on the basis of the proportions of subsistence fishing in the states to the commercial catch of inland water fish, determined in consultation with the state governments. The value added of salting and sun-drying and the collection of pearls, oysters, etc. is also estimated. Repairs, maintenance and other operational costs are assumed to form 10 per cent, 6 per cent and 1 per cent, respectively, of the gross value of output.

#### Mining and quarrying

Estimates of the gross value of output are prepared for all minerals on the basis of data available from the Indian Bureau of Mines. In the case of petroleum and gas, however, the figures are adjusted for the cost of refining, etc. The value of inputs is worked out using input ratios. For petroleum and natural gas and coal, these ratios are worked out on the basis of special reports from the Oil and Natural Gas Commission and the Coal Controller, respectively. For minor minerals, a weighted average of the above ratios for major non-fuel minerals is used.

## Manufacturing

For large-scale manufacturing, i.e., units registered under the Factories Act, 1948, the estimates have been prepared for 19 industry groups on the basis of data from the annual surveys of industries. Power-using factories employing on an average 50 or more workers and non-powered factories employing 100 or more workers are completely covered, whereas those employing 10-49 workers and 20-99 workers respectively are covered on a sample basis. Value added obtained for the census sector of the annual surveys of industries is adjusted for non-reporting units by using the value added per worker in the reporting units and the number of workers in the non-reporting units obtained from the National Sample Survey Organisation, after regrouping them into the 19 broad industry groups.

For small-scale manufacturing, estimates of value added are first prepared for the base year 1970/71. The estimates of the two subsectors, household manufacturing and non-household small-scale manufacturing, are prepared separately for urban and rural areas by 19 industry groups, using value-added data per worker and the estimated work-force in each industry group. The estimates of the work-force have been built up on the basis of the 1961 and 1971 population censuses. The bench-mark estimates of value added per worker in household manufacturing are based on national sample survey results and the index of rural skilled workers. In the case of non-household industries, the estimates of value added per worker for 1970/71 are prepared, using survey data on small-scale industries, and the adjusted results of the all-India census of small-scale industrial units undertaken in 1972 by the Development Commissioner.

The estimates for other years at 1970/71 prices are worked out by extrapolating the base-year estimates by means of indicators of physical output or input available separately for each industry group. The current-price estimates are obtained from the constant-price series by superimposing the price changes revealed by the wholesale price indexes for the relevant industry groups.

## Electricity, gas and water

The estimates of gross product for electricity and gas are prepared by analysing the accounts of public and private enterprises. For water supply, the compensation of employees is estimated on the basis of returns received from public and private enterprises, and the other components are computed from details available in the annual surveys of industries.

## Construction

Estimates of the value of construction for urban-type construction using conventional materials are based on the commodity-flow approach. Using this approach, the quantities of net available materials used in construction are evaluated to obtain their values at the site of construction. The data have been compiled mainly from the reports of the annual surveys of industries, cement production and dispatch data, Forestry in India, annual reports of the Director-General of Technical Development, the monthly statistics of the foreign trade of India, statistics of the customs and excise revenue collections of the Indian Union, wholesale prices of building materials, as well as trade and transport margins and other charges collected directly from a large number of dealers. The share of wages, mainly based on results of the national sample survey is used to obtain the total value of construction.

The expenditure approach is adopted to ascertain the value of rural-type construction, which uses materials that are readily available. The information is derived from the reports of the national sample survey, debt and investment surveys and other similar sources.

#### Wholesale and retail trade, restaurants and hotels

Detailed estimates were prepared for the bench-mark year 1970/71, listing separately the recorded sector (covered under Sales Tax Acts) and the unrecorded sector. For the former sector, data contained in the reports of distributive trade surveys (for wholesale and retail trade, hotels and restaurants in eight states) were used to obtain the value added per worker. Since, however, these surveys employ different reference years, they were adjusted by using the all-India index of consumer prices for urban non-manual employees to obtain the corresponding estimates for 1970/71. The work-force in the recorded sector of trade, hotels and restaurants was estimated by using the corresponding proportion of workers in the recorded sector to obtain the total for the eight states surveyed, and the remainder was assumed to belong to the unrecorded sector. For the unrecorded trade sector national sample survey results from 1969/70 were used to obtain value added data per worker (extrapolated to 1970/71). Since no separate estimates for the unrecorded hotel and restaurant sector were available, the corresponding ratio between hotels and restaurants and trade in the recorded sector was assumed to hold good.

For subsequent years the estimates are based on annual reports for organized trading and allied services, which are covered under the public sector, the co-operatives and joint stock companies. For the rest of the distributive trade services, the current estimates are prepared by adjusting the corresponding estimates at constant prices by the index of wholesale prices of all commodities and the index of consumer goods for trade and hotels and restaurants, respectively. To obtain the annual estimates at constant prices, it is assumed that the bench-mark estimate of value added in trade, hotels and restaurants is extrapolated by the same rate of change as for the volume of goods handled.

#### Transport, storage and communication

For railways, value added is estimated by analysing the budget documents of the central Government and the annual reports of the Railway Board. The estimates for organized road transport in the public sector, air transport, shipping transport, public sector warehousing and cold storage are prepared by means of a detailed analysis of the annual accounts of the relevant organizations and the budget documents of the central Government and state governments.

The estimates for private passenger and truck transport are prepared by multiplying the value added per worker by the relevant work force. For lorry transport, buses, taxi-cabs, auto-rickshaws and other mechanized transport, the estimate of the work-force for 1970/71 has been assumed to change at the same rate as the number of vehicles registered with the transport authorities. The annual estimates of value added per worker are obtained from survey reports for a limited number of states. For non-mechanized transport the income approach is followed, using value added per worker and the total number of workers engaged in the activity, a report of the national sample survey, the 1971 population census, etc. The activity of unorganized transport is assumed to change at the same rate as the combined index of industrial and agricultural production, adjusted to

obtain the estimates for subsequent years at 1970/71 prices before superimposing the implicit price index of mechanized road transport. The estimates for services incidental to transport are made from an analysis of eight travel agencies and annual data on the total commission paid to the travel agencies by shipping companies, air companies and railways.

For communication the estimates are compiled from the annual accounts or budget documents of the Post and Telegraph Department and Overseas Communication Services.

#### Financing, insurance, real estate and business services

The estimates of factor incomes for banks are based on data obtained from the Reserve Bank of India, its Banking Department and other banks, after deducting imputed service charges of the Reserve Bank of India, which are distributed to commercial banks in proportion to their deposits. Similarly, the estimates for financial corporations are obtained by analysing their annual accounts. The estimates for the organized non-banking financial companies have been prepared on the basis of the results of an analysis by the Reserve Bank of India covering a sample of companies. For unorganized enterprises, the data base is weak and value added is assumed to be one third of the estimated value for the organized sector. For the post office savings bank, data are available from central government budget documents.

The estimates for life insurance have been prepared mainly by analysing their annual accounts and biennial valuation reports of assets and liabilities. In respect of the non-life insurance companies, the estimates are prepared by analysing their annual accounts.

Estimates of the gross rental of urban and rural residential dwellings are based on the number of dwellings and the gross rental value per dwelling. The annual rent per dwelling in urban areas is worked out using the data received from the municipalities. Base-year estimates of the number of urban dwellings are available from the 1971 population census, extrapolated by the growth rate in the number of municipal dwellings. Gross rentals for rural dwellings are obtained using the relevant data for municipalities with a population of under 20,000, assuming that the rentals per dwelling in rural areas follow the same trend. Base-year estimates for rural areas are, however, based on the number of census dwellings and data collected from the village panchayats. Expenditure on current repairs and maintenance have been taken as 0.5 per cent and 0.62 per cent of the current value of stock of residential property in urban and rural areas, respectively. The estimates for real estate are obtained by analysing annual accounts of a sample of joint stock companies engaged in real estate services (adjusted for coverage).

The estimates for business services are obtained by using data on the value added per worker and the number of workers. The former is obtained from a national sample survey report from 1963/64 entitled "Tables with notes on professions and liberal arts", covering rural and urban areas separately and extrapolated by the urban non-manual employees' consumer price index and the wage rate for skilled workers, respectively. The number of workers is estimated annually for rural and urban areas by extrapolating 1971 population census figures by the growth rate observed between the 1961 and 1971 censuses.

### Community, social and personal services

For public administration and defence, value added is equivalent to compensation of employees only. The estimates are obtained by analysing the budget documents of the central Government, the state governments, union territories and local authorities. Complete information is not available, however, for local authorities. Estimates of consumption of fixed capital have not been made owing to difficulties of a practical nature.

For educational services, wages and salaries of staff in recognized institutions are taken as value added, adding 2 per cent to represent the value added of unrecognized educational institutions, etc. The value added per worker in research and scientific services is assumed to be the same as for educational services, and the number of workers is estimated from census data and the decennial census growth for this category. Medical and health services in the public sector are estimated from the budgets of the central Government and state governments (wages and salaries), whereas for private services other than education, public health and sanitation, the value added per worker is determined on the basis of data contained in the national sample survey report (covering rural and urban areas separately) and the extrapolation method is the same as that used for business services. The number of workers is obtained from the 1971 population census, extrapolated for other years by using the trend observed in the number of medical personnel in the case of private medical services, and the geometric growth rate between two population censuses for the remaining services. For sanitary services, data on the compensation of employees are prepared on the basis of annual reports received from the municipalities. The annual estimates of rent, interest, profits and dividends and consumption of fixed capital are based on data from the annual surveys of industries. For organized community and personal services in the form of joint stock companies, the profits and dividends and the consumption of fixed capital are estimated from the all-India income tax statistics and an analysis by the Reserve Bank of India of large and medium-sized public limited companies.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

Government final consumption expenditure is estimated by analysing and classifying the data available in the budget documents of the central Government and state governments, union territories and local authorities, supplemented by information obtained from finance accounts, appropriation accounts and reports of the Comptroller and Auditor-General of India. The estimates for local bodies are based on partial data. Expenditure of certain funds such as the Central Road Fund and the Famine Relief Fund for which information is available in the budget documents, and expenditure of the Issue Department of the Reserve Bank of India are also taken into account. Non-profit institutions serving households or business enterprises are not included. Government final consumption expenditure is estimated net of commodity sales. The purpose classification of government final consumption expenditure is also undertaken, except for local authorities, for which no data are available.

### Private final consumption expenditure

For the most part the commodity-flow approach is used to prepare the estimates of private consumption expenditure. From data on commodity production, intermediate consumption by sectors, closing stocks, etc. are deducted and opening stocks and net imports added to arrive at the estimates of net availability. From these estimates, government consumption and quantity used for capital formation are deducted to arrive at the quantity of private consumption. The quantity of private consumption of individual commodities is then expressed at producers' prices, later adjusted for gross trade and transport margins to obtain estimates at market prices.

For services the private consumption estimates for organized transport services by rail, bus, water and air are obtained by deducting the expenditure by government and business from gross passenger earnings. Estimates for unorganized services such as river boats, vehicles pulled by man-power and animal-drawn vehicles, are worked out by using estimated proportions of the corresponding national product estimates. Estimates for communication are based on revenue data after deducting expenditure for government and business purposes. A similar method is used to estimate private education and medical services, except that the cost of books and stationery is added to arrive at private consumption of education expenditure. For the remaining services, the output estimates are adopted after making the necessary adjustment for other uses. Rent estimates include both rent paid and imputed rent of owner-occupied dwellings inclusive of expenditure on repairs and maintenance and water charges.

### Increase in stocks

For public sector industries and organized private industries, the estimates are based on data contained in the budget documents of the central Government, state governments and local bodies, annual accounts and reports of public sector companies, and industries providing data on stocks at the beginning and end of the year. The studies on the finances of joint stock companies undertaken by the Reserve Bank of India are also used for this purpose. Corresponding unorganized activities are covered by inflating the estimates of the organized enterprises using sectoral value-added ratios.

The estimates for agriculture and organized private trade (other than foodgrains) are worked out on the basis of annual data on bank advances and bank margins. For livestock the estimates are based on livestock census reports, interpolated or extrapolated for non-censal years. For non-organized private trade, bench-mark stock data for 1969/70 are available from the national sample survey report No. 221 and extrapolated at the same rate as bank advances to "partnership and others". For foodgrains the estimates are based on marketed surplus in the quantity available for consumption.

### Gross fixed capital formation

For construction the estimates are based on the commodity-flow information collected for cement, iron and steel products, bricks and tiles, timber and round-wood, permanent fixtures and fittings and other building materials. This information has been drawn from a number of sources. The total value of construction is worked out under the assumption that materials form 62.5 per cent and labour inputs 37.5 per cent of the total value.

Estimates for rural construction have been prepared on the basis of the results of the all-India rural debt and investment survey conducted in 1961/62 by the Reserve Bank of India. These estimates also cover construction works, which, in general, are labour intensive (reclamation, land improvement, plantations and orchards, minor irrigation schemes, etc.). The bench-mark estimate of residential buildings is extrapolated by the combined index of income increase in unorganized sectors and population growth, whereas for non-residential construction the income growth in unorganized sectors alone is used. The value of repair construction, obtained from accounts of the public sector and private corporate sector and from survey results for the household sector, is subtracted to obtain capital formation in construction.

Estimates of gross domestic capital formation for machinery and equipment have been prepared by using the commodity-flow approach. The main sources of information are the annual surveys of industries, monthly foreign trade statistics, and customs and excise revenue statements of the Indian Union. The value of spare parts for capital goods is divided equally into capital goods and intermediate goods. The estimates are marked up for trade, transport and other charges to arrive at the value of capital goods at site. For the private sector the mark-ups are determined on the basis of data collected from leading manufacturing firms, while for the public sector they are based on information supplied by the Directorate-General of Commercial Intelligence and Statistics.

#### Exports and imports of goods and services

The estimates of exports and imports of goods and services are based on balance-of-payments data compiled by the Reserve Bank of India from exchange control records supplemented by information supplied by various government agencies. The bases for recording the data are actual consignments in respect of which documents are negotiated during the month. Estimates of travel receipts, which are generally not included in the exchange control records, are based on Reserve Bank of India surveys of foreign travel receipts and unclassified receipts.

#### Cost structure of the gross domestic product

##### Compensation of employees

For the public sector an economic analysis is undertaken of the annual data on receipts and disbursements from the budget documents and annual reports of the enterprises.

For organized sectors the current estimates of compensation of employees are based on results of the annual surveys of industries, data from the Indian Bureau of Mines, annual reports of private organized concerns, data on details of current expenditure in educational institutions and hospitals, information from municipalities on water supply, etc. Data from the income and expenditure accounts of joint stock companies by industries, published by the Reserve Bank of India, are also used.

For unorganized enterprises, the basic data are drawn from various sample surveys referring to one or more points of time within the period of the study. The indicator used to adjust the bench-mark estimate of compensation of employees to obtain the corresponding estimates for other years is the combined index of estimated change in employment and earnings per head.

### Operating surplus

Most of the sources mentioned under "Compensation of employees" are used for the estimation of operating surplus as well. For the organized sector the operating surplus is estimated by reclassifying the annual reports and accounts. For the unorganized sectors, interest and rent are estimated from independent sources and mixed income of the self-employed is obtained as a residual from the sectoral value added. Bench-mark estimates of interest and rent are generally obtained from various ad hoc surveys. The annual measures of interest are derived by using the index of estimated changes in interest income constructed as a product of the variations in the interest rate and amount of loans by representative lending institutions to different industry groups. The rent estimates are assumed to follow the trend in rent per dwelling in urban and rural areas.

### Consumption of fixed capital

Consumption of fixed capital is estimated for each industry separately. For agriculture the estimates are based on the all-India rural debt and investment survey of 1961/62 and livestock censuses; for mining and quarrying they are based on an analysis of the balance-sheets of mining companies; for organized manufacturing they are based on reports of the annual surveys of industries; for railways, communication and other departmental concerns, the basis is an analysis of the annual budget documents; for electricity, gas, water supply, non-departmental transport concerns, storage and financial institutions the basis is an analysis of annual accounts. For other industries, the consumption of fixed capital is mostly estimated as a fixed percentage of output or net product; for residential buildings it is estimated as 1.67 per cent and 2.5 per cent of the current values of the stock of residential property in the urban and rural areas, respectively (corresponding to a life of 60 years and 40 years).

### Indirect taxes and subsidies

Indirect taxes and subsidies are estimated by analysing the accounts and records of the central Government, state governments and local authorities.

### Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

Double deflation is used; outputs and inputs of agricultural crops and livestock products are evaluated at base-year prices, the base-year estimates for hunting and trapping are repeated with an arbitrary allowance for operational costs; the output of major forest products is valued at wholesale prices for the base year or otherwise deflated by the implicit price index of the major forest products, assuming the value of repairs, etc. to count for 4 per cent of the gross value of output. Finally, the quantities of marine fish, inland fish and subsistence fish caught are valued at the corresponding base-year prices, while base-year ratios to gross value of output are kept constant for inputs.



### Mining and quarrying

The quantity of output of each mineral is revalued at the base-year pithead price, while the input-output ratio is assumed to be the same as at current prices.

### Manufacturing

For large-scale manufacturing, value added is deflated by index numbers of wholesale prices at the two-digit level of national industrial classification; for small-scale manufacturing it is extrapolated by relevant indicators of physical output or input (for 19 industry groups).

### Electricity, gas and water

For electricity, value added is extrapolated by the quantity of energy sold; for gas and water supply it is extrapolated by the quantity of gas sold and the number of workers, respectively.

### Construction

Value added at constant prices is derived by applying the base-year proportion of value added to value of output. The value of output is deflated by investment cost index numbers prepared for each of the categories of general pukka construction, urban and rural residential construction, urban and rural non-residential building and other construction works and plantations.

### Wholesale and retail trade, restaurants and hotels

The base-year estimates are extrapolated by a volume index of goods handled, obtained by using the proportion of marketable surplus and base-year trade and transport margins on the total constant-price value of output by commodities.

### Transport, storage and communication

The base-year estimates for most of the organized subsectors are extrapolated by quantum indexes of physical activity, using as indicators a weighted index of passenger and goods traffic for railways, the number of transport vehicles for mechanized road transport, a combined indicator of cargo and passengers carried for ocean and coastal water transport and air transport, the combined index of industrial and agricultural production for non-mechanized road transport and inland water transport, the index of traffic handled at ports for supporting services to water transport, changes in the estimated number of workers for cold storage and other warehousing, and a combined index of the number of postal articles, inland and foreign money orders, telegrams and telephones for communication. For the rest of the subsectors the current-price estimates have been deflated for changes in the unit-value of such services due to price increases.

### Financing, insurance, real estate and business services

For financial institutions and insurance, volume indexes are used to adjust the base-year estimates of value added to obtain corresponding estimates for subsequent years. These volume indexes are mostly current-price measures that have been deflated by the over-all wholesale price index. For ownership of

dwelling the gross rent of the base-year is extrapolated by using the number of dwellings in rural and urban areas respectively. Other real-estate services are extrapolated by the number of urban dwellings. For business services the value added is extrapolated by employment data.

#### Community, social and personal services

For public administration the current estimates are adjusted for increases in pay and allowances from changes in pay scales and allowances due to increases in the cost of living.

For education, value added is extrapolated by a combined index of the numbers of teachers and students enrolled, for medical and health services it is extrapolated by using medical personnel and hospital beds as indicators, and for sanitary services and all remaining services it is extrapolated by the annual estimates of the work-force.

#### Expenditure on the gross domestic product

##### Government final consumption expenditure

This item is not estimated at constant prices.

##### Private final consumption expenditure

The constant-price estimates are prepared by extrapolating the items for which factorization into quantity and price is possible; for expenditure on services, etc., deflation by relevant price indexes is used.

##### Increase in stocks

The change in stocks in livestock, mining and foodgrains is estimated by evaluating at base-year prices the quantity of change in stocks in different years. For the rest of the items or sectors, current estimates are deflated by index numbers of wholesale prices for groups or "all commodities".

##### Gross fixed capital formation

Price deflation is used; for construction, price deflators are prepared separately, using the relevant input-structure for general pukka construction, urban and rural residential and non-residential buildings, and other construction works and plantations and afforestation; for machinery and equipment the deflators are prepared separately for domestic production and imports by index numbers of wholesale prices for the relevant groups and unit-values of imports at the group level. The change in livestock numbers is evaluated at base-year prices.

##### Exports and imports of goods and services

Exports and imports of goods and services are not estimated at constant prices.

## INDONESIA

The presentation that follows is based in the main on the comprehensive information contained in Revised Estimates of Gross Domestic Product and Expenditure: Methods and Data Sources, published by the Central Bureau of Statistics. 1/ Supplementary information was received from the Central Bureau of Statistics in March 1978.

### Introduction

#### History

In 1967 the Central Bureau of Statistics published the National Income of Indonesia, 1960-1964.

Official estimates for the period 1960-1968, containing information on concepts, definitions, sources of basic statistics and methods of estimation, were published by the Central Bureau in 1970. 1/

In 1975 improvements were made in the estimates for transport, communication and ownership of dwellings.

Official estimates for the period 1968-1974 were prepared in 1976.

#### Approaches used

##### Gross domestic product

For the most part, the production approach is used to estimate the gross domestic product.

##### Gross domestic product by kind of economic activity

The production approach is used to estimate value added of nearly all industries. The income approach is used to estimate value added of producers of government services and domestic services. Gross output of the trade and construction sectors are estimated on the basis of the commodity-flow approach.

##### Expenditure on the gross domestic product

The expenditure approach is used to estimate government final consumption expenditure and exports and imports of goods and services. The commodity-flow approach is used for gross fixed capital formation, and also for the estimation of private final consumption expenditure, in combination with the expenditure approach. Increase in stocks is estimated as a residual between the production and expenditure estimates.

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1/ Pendapatan Nasional Indonesia - National Income of Indonesia, 1960-1968 (Djakarta, Central Bureau of Statistics, 1970).

## Main statistical sources

The following are the most important statistical sources on which the production and expenditure estimates of the national accounts are based:

### Gross domestic product by kind of economic activity

Agricultural reports and surveys  
Returns of the Directorate of Forestry  
Annual surveys of industries  
Reports of mining enterprises  
Reports of transport enterprises  
Government budgets and accounts  
Reports of the Bank of Indonesia  
Censuses of population

### Cost structure of the gross domestic products

Government budgets and accounts  
Special surveys (and case studies) conducted in 1971

### Expenditure on the gross domestic product

Government budgets and accounts  
Household survey, 1969/70  
Special surveys of construction conducted in 1971  
Foreign trade statistics

### Methods and sources of estimation

Current prices

### Gross domestic product by kind of economic activity

The table of gross domestic product by kind of economic activity is prepared at market prices, i.e., producers' values.

### Agriculture, hunting, forestry and fishing

Estimates of production of the main food crops are compiled on the basis of information relating to area harvested and average yield for each crop. The area

sown and harvested for each crop is reported by the primary reporters monthly to the Central Bureau of Statistics, through the regional offices. The average yield figures for each of the main crops are based on crop-cutting experiments conducted by the Bureau, with the assistance of the field staff of the Department of Agriculture. The average yield figures for paddy are considered to be better than those for other food crops, because of lower non-response rates and non-sampling errors. Production estimates for potatoes, green beans and fruits are based on figures provided to the Department of Agriculture by its extension staff. This agency also collects data on the production of vegetables, but does not cover vegetables grown in home gardens; hence, consumption data are used in estimating vegetable production. The consumption of vegetables by households is based on per capita consumption estimates derived from the 1969/70 household survey, extrapolated by taking into account population and price changes, and an additional 1 per cent to cover consumption outside households, for which bench-mark information is obtained from the same survey.

Producer prices used in the valuation of main food crops are based on farm-gate prices reported by farmers during the agricultural surveys conducted in the period 1970-1973. For other years the trends in wholesale prices of these products are used for extrapolation.

Gross output for each main crop at current prices is obtained by multiplying the output by the corresponding average producer price. By-products are valued as a fixed percentage of the gross output of the main product, derived from special studies undertaken in connexion with the input-output study.

Value added is estimated by deducting the value of intermediate inputs from gross output. Intermediate inputs are estimated from cost-structure surveys of the main food crops carried out by the Central Bureau of Statistics and other studies undertaken in connexion with the input-output study.

The estimates of production of commercial crops grown on smallholdings are compiled by the Directorate of Agriculture on the basis of information supplied by its extension staff. These estimates are not based on any objective measurements, and adjusted wholesale or retail prices are used in their valuation. The value of intermediate goods has been calculated on the basis of a special survey of the cost structure of commercial crops in 1973, from which the percentage ratios have been kept constant for all years. Similar methods of estimation are used in the case of estate crops, but in this case the Central Bureau of Statistics collects data on a regular basis.

Estimates of livestock slaughtered are collected by the Directorate of Animal Husbandry from licensed slaughterhouses. In the case of poultry, household consumption data are used for the purpose of estimating production. Estimates of milk and egg production are likewise compiled by the Directorate of Animal Husbandry, by multiplying the appropriate number of milk cows and laying hens by the corresponding average yield per animal and output per bird, respectively. Producer prices are not collected for these products; adjusted wholesale and retail prices are used instead. Intermediate inputs are calculated as fixed percentages of gross output of the products.

Data on own-account consumption of agricultural products are available from SUSENAS surveys on consumer expenditure.

The main source of data on the output of forest products in forest areas is the Directorate of Forestry, based on returns furnished by the field staff. For timber and firewood produced in agricultural areas outside the forests, the estimates are based on a special survey undertaken by the Directorate of Forestry in 1964, and using the increase in the number of households as indicator of the trend of production. A similar procedure is used in the case of firewood. Estimates of bamboo production outside forest areas are built up on the basis of the number of bamboo cuts as revealed in a survey conducted in 1973. The prices used to evaluate production vary according to the type of product and source of production. The cost structure for forestry products is mainly based on annual reports of the State Enterprise for Forestry.

Production estimates of marine and inland fisheries are obtained from the Directorate General of Fisheries. Information is gathered mainly at auctions and from wholesale dealers and owners of fish ponds. Own-account consumption of fish is estimated as a given proportion of the total catch. The value of intermediate inputs is derived from cost-structure studies undertaken in connexion with the input-output study, and the same ratios used for the other years.

#### Mining and quarrying

Initially, gross output, intermediate inputs and value added are calculated for each mining product for the base year 1971. Value added for 1971 is extrapolated by the production index in respect of each individual product and the corresponding producer price index. The main sources of data on mineral production are the Department of Mining and Pertamina. The most important mining commodity is crude petroleum, for which production data are available for all enterprises concerned. Estimates of prices and input costs are compiled on the basis of returns covering production, sales and costs of production furnished by the largest operating firm. Data on prices for several other mineral products are taken from reports of various companies, and this also applies to data on the composition of inputs. In the case of quarry products, only rough estimates are available, based on inputs for construction and manufacturing derived from the input-output table for 1971.

#### Manufacturing

For the base year 1971, data on output and input structure have been compiled for each industry group from industrial statistics maintained by the Central Bureau of Statistics and information gathered through surveys and other studies undertaken in connexion with the compilation of the input-output table. For other years, industrial production indexes are compiled on the basis of the output of selected manufactured products that are assumed to be representative of each industry group for serving as indicators of output for the years 1968-1975. The main statistical sources are annual industrial surveys and annual reports of government departments and state enterprises. The statistical unit for the collection of data on manufacturing is the establishment. The price indexes of manufactured commodities for the years 1970 to 1973 are calculated by obtaining the unit price of manufactured products produced by large and medium-scale industries. For completing the series for other years the trends in wholesale or export prices for these products have been used. Data on prices are obtained from publications on price statistics and manufacturing statistics issued by the Central Bureau of Statistics.

Basic data on small-scale manufacturing (or the traditional sector) have been derived from surveys of small-scale manufacturing and handicraft conducted periodically by the Central Bureau of Statistics.

#### Electricity, gas and water

For the base year 1971, basic data on production, prices and cost structure for electricity, gas and water supply have been compiled on the basis of information gathered from various establishments. Firm estimates of output and prices for other years are available only for the major production units. In the case of smaller establishments, estimates have been derived from information gathered from scattered sources. Data on electricity services supplied by the State Electricity Company (PLN) have been compiled from information supplied directly by the PLN, while the production of electricity by other enterprises and establishments has been estimated from the Industrial Census 1974 and the annual surveys of industries. Data on gas production and prices are reported by the State Gas Company, while information on water supply is obtained from reports of the association of water supply companies. Supplementary data on prices are derived from the consumer price indexes of the Central Bureau of Statistics.

#### Construction

The estimation of the total value of output of the construction sector is based on the commodity-flow approach. The average ratios of intermediate inputs to gross output are based on data gathered from surveys of representative units of various types of construction projects. Information on imports of construction materials is derived from commodity imports statistics; to the c.i.f. values of the different construction materials, sales taxes, import duties and trade and transport margins are added in order to arrive at their values at sites of construction. Likewise, the value of domestically produced construction materials is based on the 1971 industrial survey, to which are added trade and transport margins obtained from special surveys. For other years, quantity indexes of the supply of construction materials from domestic production and imports are used together with price indicators of construction materials. Fixed ratios of the gross output to material input costs are used in deriving value added.

#### Wholesale and retail trade, restaurants and hotels

The gross output of the trade sector is calculated on the basis of estimates in producers' values of the marketed surplus of agricultural produce, manufactured goods and selected mining and quarrying products and the cost (c.i.f. values plus indirect taxes) of imported goods passing through the normal trade channels. These data are multiplied by distribution percentage mark-ups gathered from special surveys of trade undertaken in connexion with the compilation of the input-output table for 1971. The input-structure of the trade sector in 1971 is also based on a special survey of trading establishments. Estimates for other years are calculated by extrapolating the 1971 value by a quantity index of marketed surplus traded and an implicit price index of traded commodities.

The gross output of restaurants and hotels for 1971 is calculated on the basis of average output per employee and the number of employees in this sector, obtained from special surveys. Estimates for other years are calculated by using an index of the number of workers engaged and the consumer price index.

### Transport, storage and communication

For railways, the annual reports of the State Railway Company constitute the main source of data for estimating gross output, intermediate inputs and value added. The average earnings for each type of vehicle and input costs of road transport are based on the results of a special survey undertaken in connexion with the compilation of the input-output table for 1971. Gross output and input values are estimated by multiplying these averages by the corresponding number of vehicles of each type. Estimates for other years are based on the fixed value-added ratio for 1971, indexes of the number of vehicles of each type and changes in tariff rates. Data for the compilation of the several indicators used in this estimation are furnished by the Directorate of Road and River Transport and the State Police.

The income derived from the transport of goods by sea is based on the total tonnage of goods transported by national carriers covering imports and exports and interisland trade, and the average earnings per ton. Data on the number of passengers and average earnings from passenger transport are supplied by the Directorate of Shipping and by Pelni. Input-output ratios based on cost-structure surveys are used in deriving estimates of value added. In the case of river transport, only limited data are available, covering average earnings of boats in West Kalimantan. Fixed value-added ratios based on special surveys are used for all years. Data for the estimation of harbour services are obtained from the Port Administrator of Tanjung Priok and from Pelni's Master Guide.

The basic information on the income and operating costs of air transport services are obtained from the reports of the national airlines, while data on airport services are based primarily on returns furnished by the principal airport authority suitably adjusted to take account of services provided at other airports.

Gross output for services allied to transport is estimated on the basis of average revenue per ton cargo loaded or unloaded, handled or stored derived from a special survey, and the total volume of cargo accounted for under each operation. For communication services data on revenues and operating costs are obtained from P.N. Post and Giro and Perum Telekom.

### Financing, insurance, real estate and business services

The information on gross output and value added of the banking sector is estimated on the basis of data compiled annually by the Bank of Indonesia, supplemented by special inquiries for other financial intermediaries. The main data source for estimating insurance activity is the publication Insurance Activity in Indonesia, 1971-1972, issued by the Directorate of Insurance.

Basic data relating to real estate and business services are limited, and rough procedures are adopted by making use of information gathered through special surveys undertaken in connexion with the compilation of the input-output table for 1971. The bench-mark estimates are extrapolated by using an index of the number of workers employed in these activities and the wholesale price index. For ownership of dwellings, gross output for the base year is estimated by multiplying the average per capita estimate of gross rent by the mid-year population, extrapolated by using indexes of prices and population growth. In estimating value added, it has been assumed that input-output ratios remain unchanged.



Hitherto, no separate data on owner-occupied dwellings have been available for independent estimation, but more recent household surveys have made provision for the collection of such information.

### Community, social and personal services

For public administration and defence, the data on wages and salaries, etc. for central government are obtained mainly from the current budget expenditure of the Director-General of the Budget, and for local government they are derived from information furnished by local government bodies to the Central Bureau of Statistics on their budgetary operations.

For the private services, few data are available; the estimates of gross output and value added for most services are computed on a rough basis. In most cases estimates are calculated initially for the bench-mark year 1971, and then extrapolated to other years by using employment and price indicators. The gross output of educational activities is based on data relating to average expenditure per student and total number of students supplied by the Department of Education and Culture. Estimates of gross output for health services are based on average expenditure or income per bed and average earnings of doctors and other medical personnel. For most recreational and cultural services, the bench-mark estimates are compiled by using 1971 census data on employment and survey data on average earnings. For domestic services, data on employment are derived from the population censuses and average wage costs are obtained from a special survey of domestic services in selected cities. For other personal services, the 1971 estimates have been obtained by using the census data on employment and the average output per worker from a special survey of establishments and self-employed workers.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

The main sources of data for the estimation of central government consumption expenditure are the budgetary accounts of the Department of Finance. From the routine (current) budget, all transfer expenditure is deducted, including subsidies and grants to local governments and public debt repayments and interests. Items of a capital nature are excluded, whereas certain current expenditure on wages and salaries and materials appearing in the development budget is included in government consumption expenditure.

For local government, the estimates of expenditure are made on the basis of data compiled by the Central Bureau of Statistics directly from the local bodies. For this purpose returns are obtained from provincial and regional governments on a complete basis and from village administrations on a sample basis.

Government consumption expenditure has been defined to include the value of goods and services produced for its own use, less the value of commodity and non-commodity sales (e.g. fees charged in schools, hospitals etc.).

#### Private final consumption expenditure

For the purpose of estimating household consumption expenditure, the information relating to the supply and disposition of goods and services available

in the input-output table for 1971 is used as a bench-mark source. In preparing the estimates for the base year, data on production and imports of household goods and services classified according to commodity groups have been used, together with information on their consumption by households as derived from the 1969/70 household survey and other sources. The estimates for other years are compiled by using indexes of consumption based on commodity supplies for household use and indexes of prices derived from the consumer price index for extrapolation and inflation of the bench-mark estimates. In the case of commodities with multiple uses, the proportions used for household consumption for the bench-mark year are assumed to remain constant for all years.

#### Increase in stocks

Change in stocks for the years 1968-1975 is estimated as a residual and includes the statistical discrepancy between production and expenditure estimates. The increase in stocks for a limited number of commodities is shown in a foot-note to the relevant tables.

#### Gross fixed capital formation

Bench-mark data on capital formation provided in the input-output table for 1971 are estimated by using the commodity-flow approach, based on statistics of imports and domestic production of construction materials and machinery and equipment. The input-output ratios for buildings and structures have been established for 1971 on the basis of special surveys on construction projects in that year.

Estimates of fixed capital formation in buildings and structures for other years are calculated by extrapolating bench-mark data by quantity and price indexes of domestic production and imports of construction materials. In the case of domestically produced machinery and equipment, estimates for other years are compiled by using a production index of machinery and equipment to extrapolate the corresponding bench-mark estimate together with an implicit price index of machinery and equipment. Imports of machinery and equipment are obtained directly from the import trade statistics maintained by the Central Bureau of Statistics.

#### Exports and imports of goods and services

Data on merchandise exports and imports are obtained from foreign trade statistics maintained by the Central Bureau of Statistics, while data on services relating to exports and imports are derived from balance-of-payments statistics compiled by the Bank of Indonesia. The items selected pertain to non-factor payments, which consist mainly of transportation and communication services. Freight charges levied by residents on exports and passenger fares for international travel are also accounted for.

The import figures have been adjusted to include direct import of machinery for the purpose of off-shore operations of the Pertamina oil company and direct import of rice by the Board of Logistics, which are not covered in the import statistics compiled by the Central Bureau of Statistics.

## Cost-structure of the gross domestic product

### Compensation of employees

This item is not estimated explicitly but is combined with the operating surplus as a residual obtained by deducting consumption of fixed capital and net indirect taxes from the gross domestic product.

### Operating surplus

See under "compensation of employees" above.

### Consumption of fixed capital

The consumption of fixed capital is estimated in respect of producers' stocks of all types of fixed assets, other than land improvements, plantations, timber tracts, roads, dams and similar construction. In general, the depreciation for each sector is estimated on the basis of the results of special surveys conducted for the purpose of input-output compilation. For manufacturing, electricity, gas and water supply estimates are based on information available at the Central Bureau of Statistics.

### Indirect taxes and subsidies

The principal sources of data for indirect taxes and subsidies are the budgetary accounts of the central government and local governments. The principal taxes included here are import and export duties, sales taxes, betting taxes, licence duties, stamp duties, etc. Subsidies include grants on current accounts which private industries or producers receive from the Government, grants on current accounts which the Government makes to public corporations and grants to government enterprises to cover losses resulting from the government policy of maintaining prices below production costs.

## Constant prices

### Gross domestic product by kind of economic activity

#### Agriculture, hunting, forestry and fishing

Double deflation is used; the standard procedure adopted is first to estimate the value of production in each subsector at base-year (1971) prices and then to deduct intermediate costs, which are calculated as fixed percentages of the gross output of each product as derived from the input-output study.

#### Mining and quarrying

Value added is extrapolated by the production index in respect of each individual mineral product.

#### Manufacturing

Value added is extrapolated by quantum indexes for each industry group.

### Electricity, gas and water

Value added is extrapolated for electricity, gas and water supply combined by using the corresponding quantity indexes of production.

### Construction

Value added is extrapolated by quantity indexes of supply of construction materials from domestic production and imports.

### Wholesale and retail trade, restaurants and hotels

For the trade sector, value added is extrapolated by a quantity index of marketed surplus traded. For restaurants and hotels, an index of the number of workers engaged in this sector is used as indicator.

### Transport, storage and communication

Value added is extrapolated by various quantity indicators of output, such as passenger-kilometres and ton-kilometres for railways, the number of vehicles in operation for buses, trucks, taxis etc., dead weight tonnage, the number of letters handled, telephone connexions etc. and the number of persons employed.

### Financing, insurance, real estate and business services

For banking and other financial institutions, constant-price estimates are calculated by using indicators of total loans advanced in real terms for extrapolating base-year estimates. For insurance, an index of investment of insurance funds in real terms is used. For business services, the bench-mark estimates are extrapolated by an index of the number of workers employed in these activities, whereas the index of population growth is used as an indicator in the case of ownership of dwellings.

### Community, social and personal services

For public administration and defence, the constant-price estimates are calculated by using a moving average of the consumer price index as a deflator.

The constant-price estimates for social and community services are calculated by using various quantity indicators, such as the number of students, the combined index of the number of hospital beds, the number of doctors and paramedical personnel, the number of social institutions etc. For recreational and cultural services, the bench-mark estimates are extrapolated by using various indicators such as indexes of the number of film productions, the number of attendants in cinemas, the growth of employment in recreational services etc. Constant-price estimates for personal and domestic services are estimated by using as extrapolator an index of the growth of employment in these services.

### Expenditure on the gross domestic product

#### Government final consumption expenditure

Estimates of expenditure on personal emoluments at constant (1971) prices are obtained by deflating the current values by a moving average of the consumer price

index, for expenditure on materials purchased deflated by the wholesale price index (excluding the export group).

Private final consumption expenditure

Base-year estimates are extrapolated by using indexes of consumption based on commodity supplies for household use.

Increase in stocks

This item is estimated as a residual.

Gross fixed capital formation

For buildings and structures, the bench-mark data are extrapolated by quantity indicators of the domestic production of construction materials and volume indicators of imports of construction materials; for domestically produced machinery and equipment data are extrapolated by using a production index of machinery and equipment, and the quantity index of domestic production is also used for deflating the current values of imported machinery and equipment.

Exports and imports of goods and services

The value of exports and imports at current prices is deflated by the corresponding unit value price indexes computed by the Central Bureau of Statistics.

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