

INTRODUCTION

The National Income Committee set up by the Government of India in 1949 produced, for the first time, national income estimates for the entire Indian Union. The estimates along with the methodological details were published in the *First and Final Reports of the National Income Committee* (Ministry of Finance, 1951 & 1954). The Committee encountered several problems of estimation mainly due to the many gaps in the statistical field. Subsequently to improve the empirical data base for measuring national product and related aggregates special efforts were made from time to time for a comprehensive review of all available data both published and unpublished. The first results of these efforts were presented by the Central Statistical Organisation, Ministry of Planning (CSO) in the *National Income Statistics—Proposals for a Revised Series of National Income Estimates, 1955-56 to 1959-60* (CSO, 1961). These proposals were discussed in detail at a Seminar especially organised for the purpose and in the light of the comments and suggestions made by the experts in the field of national income, several follow up studies were undertaken. The results of these studies along with the revised series of national income were published in *Brochure on the Revised Series of National Product for 1960-61 to 1964-65* (CSO, 1967). The revised series had also a new base year (1960-61) for the constant price estimates, the base period of the earlier estimate being 1948-49.

0.2. Simultaneously, with the revision of estimates of national product, attention was paid to the preparation of the related aggregates like capital formation and saving. Such estimates for the period 1960-61 to 1965-66 were brought out along with the details of the methodology adopted in two special Brochures, viz., (1) *National Income Statistics—Estimates of Capital Formation in India, 1960-61 to 1965-66* (CSO, 1969) and (2) *National Income Statistics—Estimates of Saving in India, 1960-61 to 1965-66* (CSO, 1969). To meet the demand of the users regarding details of estimates of national product etc. a special supplement viz., *National Accounts Statistics, 1960-61 to 1972-73—Disaggregated Tables* (CSO, 1975) was also brought out. This publication gives the disaggregated tables on outputs, inputs and value added by industry groups, private consumption expenditure by object and saving and capital formation by types for public, private corporate and households sectors and covered the period 1960-61 to 1972-73. The publication includes the data at current prices for the period 1960-61 to 1972-73 whereas for the constant (1960-61) price series the details are given for the complete period beginning in 1950-51.

0.3. The coverage of the annual *National Accounts Statistics* (NAS or alternatively, White Paper) has been extended gradually to incorporate the estimates of capital formation, saving, private consumption expenditure, factor incomes and the disaggregated tables. The deliberations of the Standing Advisory Committees on 'Collection of Data for National Income' and 'Compilation and Analysis of National Accounts', helped in this process of gradual augmentation of the scope and coverage of the annual NAS. The 'White Paper' published in January, 1978 introduced, for the first time, a more recent base (1970-71) for the series at constant prices replacing the earlier base of 1960-61. The annual publication on national accounts besides including the estimates, has an introductory write-up giving a brief analysis of the results and highlighting the more important aspects of the behaviour of the Indian economy over the recent past. The latest issue of NAS published in February, 1980 contains data upto 1977-78.

0.4. The NAS is divided into six parts. Part I deals with national product and gives the summary tables on the trends in national product, per capita income and consumption both at current and constant prices, rates of saving and capital formation, data on other related aggregates such as net national product at market prices, personal income and private income. In a separate table the price and quantum indices implicit in the estimates of domestic product, consumption expenditure and capital formation have been presented and compared with similar data available from independent sources. This part also includes the details of gross and net domestic product by industry of origin and its percentage distribution over sectors. Estimates of factor incomes have been presented in Part II. Distribution of factor incomes is given by broad group of sectors and by organised and unorganised enterprises with the former further sub-divided into public and private sectors. Part III contains details of capital formation, saving and private consumption expenditure. Both capital formation and consumption expenditure are given at current and constant prices. Further, capital formation estimates are presented both by type of assets and by industry of use. Part IV deals with the transactions of the public sector. Other than details of aggregates like value added, consumption expenditure, saving, capital formation, this section presents the economic accounts separately for administrative departments and non-departmental enterprises. Purposewise details of both current and capital expenditures of administrative departments have also been presented in this

section. Part V contains the disaggregated tables which include the details of gross values of output, input and value added for each of the industry groups. Thus, under agriculture and allied activities, estimates of gross value of output are given separately for individual crops and livestock products and estimates of input by items like seed, organic manure, chemical fertiliser and transport. The nature and extent of disaggregated data vary from industry to industry depending on the availability of information and method of estimation. The details of factor incomes, saving and capital formation are also included in Part V. Part VI present the four consolidated accounts of the nation covering all principle transactions of the economy. The data presented thus summarise the results contained in the rest of the publication.

0.5. Each annual issue of NAS also presents data on such aggregates/components which are either not of regular nature or which have been presented for the first time or which refer to back year series of available measures. So far public sector data were available at current prices only. However in the latest issue of NAS an attempt has been made, for the first time to prepare and present the estimates of domestic product, capital formation and final consumption expenditure of the public sector at constant (1970-71) prices for the period 1970-71 to 1977-78. These have been included in Statements 14, 17, 19 and 22 of NAS. Besides these, the latest issue of NAS includes appendices giving special tables on constant price estimates of net/gross capital formation by type of assets and by industry of use for the period 1950-51 to 1969-70 with price base revised to 1970-71 prices. The series of private final consumption expenditure for the period 1950-51 to 1969-70 at 1970-71 prices prepared by CSO are also published for the first time in this issue. Similarly NAS (January 1979) contains net/gross national product at factor cost by industry of origin for the past period (1950-51 to 1969-70) with the revised constant price base, while NAS (January 1978) gives the Inter-industry transactions Table for 1968-69. This issue also publishes comparable series of distribution of working force for the years 1961 and 1971 and estimate of saving and capital formation (by type of assets and by industry of use) for the period 1950-51 to 1959-60. The series of capital formation published in the latest issue of NAS serves the purpose of a complete series with the recent price base.

0.6. The estimates prepared annually use the latest available data collected from different sources. To ensure the use of the most recent information (e.g. point estimates from occasional sample surveys) it becomes necessary from time to time to introduce minor revisions in the method of estimation followed. Such changes are generally indicated briefly in the annual White Paper as and when they are introduced. The

present volume gives comprehensive methodological details in respect of the estimates presented in *National Accounts Statistics, 1970-71 to 1977-78* (CSO, 1980).

0.7. The publication is divided into seven broad parts. The first part covers national product and the measurement of value added in each of the sectors (industry groups) is discussed in detail in fourteen different chapters. Within each of these sectors, details are presented separately for each of the sub-sectors for which separate estimates are prepared. The extent to which the industry groups can be sub-classified depends primarily on the availability of data. Following the chapters on individual industries there are two separate chapters devoted to Working Force and Net Factor Income from Abroad. The estimates of working force are used for the measurement of base year value added in a number of unorganised sectors for which the usual product approach becomes impracticable. The measurement of net factor income from abroad is essential for estimating net national product which is the algebraic sum of the former and the aggregate net domestic product. The discussions on net national product in Part I is followed by the methodological details in respect of national income, i.e., factor incomes, national expenditure covering domestic saving, capital formation and private consumption expenditure and national accounts. Part II is concerned with factor incomes, Part III deals with consumption, saving and capital formation, Part IV deals with Public sector, Part V is concerned with consolidated Accounts of the Nation, and Part VI deals with the method followed for preparing 'Quick' estimates of national product and related aggregates. In order to cover the subject exhaustively, a chapter has also been added giving the Glossary of the Main Terms used in NAS or generally in the literature on the subject. This comes as the Part VII of the volume.

0.8. In general, each chapter is divided into three Sections. Section I deals with the details of the coverage of the sector in terms of economic activities included. Section II deals with the methodology followed and the source material used for the preparation of the estimates at current and constant prices. Section III makes an assessment of the reliability, objectivity and the current status of data which are collected from the various sources and also undertakes an overall appraisal of the estimates.

0.9. Revision of the national income estimates is a common practice even in countries with better or more up-to-date data base and is linked with availability of basic data. The estimates of national product and related aggregates for this country undergo revisions as and when complete/revised data become available. The methodology of preparation of the estimates is also modified from time to time to utilise fresh data in respect of each sub-sector as and when they become available. The past estimates for more recent

years, are revised annually at the time of the issue of the fresh estimates. However, depending on the availability of data the process of revision does not always end with annual changes but sometimes, extend over a large number of preceding years. This generally happens for the estimates in respect of the unorganised sectors where 'bench mark' estimates are based on periodic survey results or on 'bench mark' data like the decennial or quinquennial censuses. Thus, revision of past estimates becomes often necessary, when fresh surveys are conducted and is undertaken after a number of years because of the lag between the period of reference of the surveys and the date of availability of the results.

0.10. A comparison of such revisions over a number of years and their analysis would not only enable a better judgment of the levels of these estimates but also help in developing suitable methods of short-term forecasting. An examination of such estimates of net national product for the past few years suggests that the overall effect of the revisions in the estimates is not large. At the sectoral level, however, the extent of revision is substantial in some cases and further, the revisions are in either direction (i.e. either reduces or increases the value level). In the case of the primary sectors, revision of the basic data (with the arrival of final forecasts and fully revised figures of agricultural production) mainly account for the variation in the estimates. For sectors like manufacturing, on the other hand, there are often gaps in basic data (e.g. non-availability of ASI results) at the time of preparations of the first set of estimates. In the case of public administration and defence, railways and communication, the estimates are revised as and when the budget estimates are replaced by the "actuals" or "revised". In the case of the unorganised sectors, on the other hand, the measurements are often based on limited available data on indicators or on past trends at the time of preparation of the first set of estimates. These are subsequently revised when data from fresh surveys/type studies become available.

0.11. Such comparisons of estimates can be undertaken also for major components of expenditure like final consumption expenditure and capital formation as well as for saving. Since the estimates of private final consumption expenditure and capital formation are obtained by the commodity-flow method, all revisions in the estimates of national product which are due to the availability of fresh data on production of commodities will naturally affect estimates of these aggregates. Further, these aggregates would, also be affected by revisions in the data either on exports/imports or the trade and transport margins. As regards saving, as the measurement of financial saving is mostly based on current data, it is affected only marginally because of the use of the fresh information. This, however, is not true for household saving

in physical assets the revisions wherein are linked with the revisions in the estimates of capital formation.

0.12. In view of such revisions in the estimates as and when fresh data become available it is worthwhile to attempt a broad assessment of the extent to which the estimates of domestic product are based on direct current data. This will be particularly pertinent if estimates for one of the more recent years are used for evaluation. The proportion of direct current data implicit in the estimates will vary between years particularly in the unorganised sectors. The proportion is likely to be higher for those years for which bench-mark data become available. This, for example, would be true for the estimates for 1971-72 for all such sectors for which either 1971 Census results on population/working force or data from RBI All-India Debt and Investment Survey, 1971-72 form one of the basis for the estimates. This will affect the proportion of inputs in agriculture, own account capital formation in the household sector for this year and domestic product in trade, unorganised transport and services sectors. In the case of unregistered manufacturing, on the other hand, the current data available from National Sample Survey (NSS), refer to the results of 29th Round: 1974-75. This is also true of input rates for minor minerals which are obtained from the same source.

0.13. Considering the year 1975-76, the sources of data of output and input have been examined for each of the sectors from the point of view of not only their current status but also their direct relevancy. In sectors like agriculture, mining and registered manufacturing, the extent of current data in use can be measured without any difficulty as the data used for estimation are of direct relevant nature. In case of sectors like construction and trade, the problem of evaluation of the quantum of current data used in estimation raises problems. For example, in the case of construction, though current data are available on input of five specified construction materials, sufficient data of current nature are not available on proportions of input of other materials and of labour. In the case of trade, the bench mark estimate is taken forward using the total value of marketed output of commodity producing sectors which it is assumed is a measure of quantum of goods handled. Also current data on proportions of total output marketed and trade and transport margins are available annually for a few items only. In the case of such sectors, since the indicators used for preparing the estimates are current but are of indirect nature, two alternative proportions have been worked out. In the first alternative for these sectors, only the estimates for the public and private corporate sectors for construction and public sector for trade have, therefore, been considered as based on current data. Alternatively however, for these sectors the proportion of current data used for the estimates have been determined according to the--

current nature of the indicators (i.e. the proportion of value of five specified construction materials in total value of construction and current nature of the value of marketed commodities in the total value of goods handled.) This approach gives two alternative estimates of the overall proportion which can be assumed to give the range.

0.14. Using such criterion the estimates of the share of net domestic product based on direct current data for the year 1976-77 has been presented in table 0.1. Examples of current data in the case of agriculture are figures of actual output of responding States. The production of agricultural crops based on area are not treated as direct current data even if the area estimates are available for the current year. Also, annual estimates of all livestock products are excluded from the list of current data even though current data on milk yield rates separately for cows and buffaloes are available for many of the States. Similarly, the use of the index of production of specified groups of commodities in the registered manufacturing sector for carrying forward/backward the bench mark estimates in the corresponding industries in the unregistered manufacturing establishments has not been considered as current data base even though the bench mark estimates in such cases are based on direct current data. For each sector where value added method is used for measurement of domestic product, the shares of current data in output and input have been combined using the total values under the respective categories as weights to obtain the overall proportions for value added.

0.15. For mining, registered manufacturing, railways, communication, banking and insurance, and public administration and defence, the estimates are based almost completely on current data. However, these together account for only 22 per cent of the total net domestic product. In the case of 'agriculture', 'forestry and logging' and 'fishing' (accounting for 42 per cent of the domestic product) about 61 per cent of the estimates are based on annual current data. The proportion of value added estimates based

on direct current data in the case of remaining sectors (i.e. 'construction', 'unregistered manufacturing', 'transport by other means and storage' 'trade', real estate & ownership of dwellings' and 'other services' accounting for about 35 per cent of domestic product) is only 28 per cent in a non-benchmark year. This is so because in a non-benchmark year, for construction and trade very limited direct current data can be said to have been used for estimation if current indicators are not treated as current data. The overall proportion of value added based on direct current data in this case works out at 57 per cent of the total net domestic product. If however current indicators are considered as current data for this exercise the share of the sectors of construction and trade go up to 72.7 and 70.3 per cent respectively and the overall proportion works out at 68 per cent.

0.16. It can probably be assumed that the table 0.1 presents the lower and upper bounds of the current data base of the estimates. In the years when direct data are available for the preparation of bench-mark estimates (e.g. 1974-75, for which NSSO 29th round results on unregistered manufacturing sector and input rates of minor minerals are available), the proportions will go up substantially.

0.17. In the case of private final consumption expenditure and capital formation, estimates have been prepared using the commodity flow approach and as such estimates of the portion based on direct current data will be directly related to that of domestic product. Estimates of saving, contrary to this situation, are based on independent set of data on financial instruments. Direct current data for items like currency, shares & debentures, provident fund, deposits, advances etc. are available with hardly any time lag except for local bodies and branches of foreign companies. Since, the contribution of local bodies and branches of foreign companies is negligible in the context of household or public or corporate sector saving, the estimates of financial saving can be taken to be based on direct current data available from different sources.

TABLE 0.1 : SHARE OF ESTIMATES OF NDP BASED ON DIRECT CURRENT DATA, 1976-77

Industry	Percent Share in total ndp	% of estimates based on direct current data			Remarks
		output	input	value* added	
(1)	(2)	(3)	(4)	(5)	(6)
1. agriculture	39.8	67.6	21.5	58.2	Output—all crops for which direct production data are available. Input—Chemical fertilizer, irrigation charges, electricity pesticides.
2. forestry & logging	1.2	59.7	0.0	56.9	actual data available from all the states except Haryana, J.&K., W.B., and A.&N. Islands.
3. fishing	0.9	96.2	0.0	83.9	actual data available except for subsistence fishing

TABLE 1 : *Contd.*

(1)	(2)	(3)	(4)	(5)	(6)
4. mining & quarrying	1.3	100.0	97.6	99.4	all inputs except for minor mineral for which current data refer to 1974-75.
5. manufacturing					
5.1 registered	9.9	100.0	100.0	100.0	ASI.
5.2 unregistered	5.8			26.1	estimates of the sub-sectors where annual indicators refer to unregistered sector (e.g. cotton textile) are treated as current.
6. construction					
Alt. I	5.8	48.6	50.7	49.3	Output—public and private corporate sectors. Input—cement, steel and fixtures and fittings used in public and private corporate sectors.
Alt. II	5.8	84.5	58.6	74.7	Output—covered by commodity flow approach. Input—five specified construction material (i.e., cement, steel, bricks & tiles, timber and fixtures & fittings)
7. electricity, gas & water supply.	1.3			100.0	based on accounts and data directly collected from municipalities.
8. railways	1.5			100.0	based on accounts.
9. transport by other means and storage.	2.8			33.3	direct data on air, mechanised road(public) mechanised, water transport and storage are available from account and ASI.
10. communication	0.7			100.0	based on accounts.
11. trade hotels and restaurants					
Alt. I	13.1			6.4	public and private corporate sectors trading activity.
Alt. II	13.1			76.9	based on direct current data on value of marketed goods handled.
12. banking and insurance	3.1			94.6	total activity except unorganised money lenders and non-responding enterprises.
13. real estate, ownership of dwellings & business services	2.6			50.8	urban house property from municipalities and real estate companies from accounts for which data are being collected annually.
14. public administration	5.1			92.5	annual accounts except for non-responding local bodies.
15. other services	5.1			64.2	education, medical health in public sector, sanitary services and operating surplus of joint stock companies.
16. total					
Alt. I	100.0			57.6	
Alt. II	100.0			68.4	

* For sectors where product approach is followed for measurement of value added proportions of output and input based on direct current data have been combined in the following manner :

$$V_i' = \frac{\alpha_i x_i + \beta_i y_i}{x_i + y_i} \quad (1)$$

where i represents the sector, V_i' the value added based on direct current data, x and y respectively total output and total input and α and β corresponding percentages based on direct data. Alternatively this share V_i' can also be obtained using the formula

$$V_i' = \frac{\alpha_i x_i - \beta_i y_i}{x_i - y_i} \quad (2)$$

where $\alpha_i x_i - \beta_i y_i$ is value added based on direct current data and $x_i - y_i$ is the total value added for sector i . Now, for every sector (i),

$$\frac{\alpha_i x_i - \beta_i y_i}{x_i - y_i} - \frac{x_i + \beta_i y_i}{x_i + y_i} = \frac{2x_i y_i (\alpha_i - \beta_i)}{x_i^2 - y_i^2} \quad (3)$$

Since $x_i > y_i$ and also that generally a larger percentage of output than of input is based on current data, the value of equation (3) will in general be positive. However, the percentage of value added based on direct data in the second alternative works out to more than 100

for sectors where $\frac{\alpha}{\beta} > \frac{y}{x}$

In view of this the results of the first alternative i.e. equation (1) have only been used for the present exercise which may be said to give the lower bounds of V_i' for each of these sectors.