STRUCTURE OF INDIAN ECONOMY : INTER-INDUSTRY FLOWS AND PATTERN OF FINAL DEMANDS 1964-65

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SUMMARY. The structure of Indian economy for the year 1964-65 is presented by way of an input-output table. This table is prepared at 1960-61 producers' prices. Almost the entire portion of the material outputs arising out of agriculture and manufacturing industries have been covered by the table. Railways and motor transport have also been represented in the table. There are certain sectors of the economy, like services, for which the direct estimates of output as well as the distribution of these outputs are not available. Such sectors have been left out while preparing the table. The part of the economy covered has been divided into 77 sectors. In terms of value added the coverage is about 67% of the entire economy.

A sectorwise comparison has been made with National Income Estimates prepared by Central Statistical Organisation. Different official and non-official sources have been utilized to get the inputs and outputs of different sectors.

1. INTRODUCTION

The structure of an economy can be shown by way of an input-output table. An input-output table is the systematic recording of the flows of transactions between the different sectors of an economy which provide a statistical description of the inputs and outputs of the various sectors of the economy during a particular period of time. The recording is done in the form of a two-way table in which the row of a particular sector gives the distribution of the total available supply of the sector (output+imports—exports). The column of a sector represents the inputs into the sector from various other sectors. The vector of inputs of the sector, thus formed, gives the input structure of the sector. The figure in the *i*-th row and *j*-th column is the output of the *i*-th sector, utilized as an input by the *j*-th sector.

The table consists of two quadrants the first quadrant consisting of that part of production of various sectors which is consumed by the various producing sectors as intermediate inputs. The second quadrant consists of that part of the output which is absorbed by household consumption, government consumption, investment, exports and other such uses which are not of intermediate type. In the second quadrant household consumption is of major importance.

The formal structure of the input-output accounts can be mathematically described by the equations :

$$X_i + M_i = \sum_j a_{ij} X_j + F_i \qquad (i = 1, ..., n). \qquad ... \quad (1)$$

These equations refer to the rows of the input-output table. Here X_i is the output of the *i*-th sector; M_i is the import of the output of that sector; a_{ij} refers to the input requirement of the *i*-th sector per unit output of the *j*-th sector (which will hereafter be called the current input coefficient); $\sum_j a_{ij} X_j$ gives the total requirement of the *i*-th

sector, by all of the producing sectors of the economy. F_i is the final demand for the output of the i-th sector and consists of household consumption, government consumption, exports, gross fixed capital formation and change in stocks. The left hand side of the equations gives the total supply and the right hand side gives the total demand.

Again for the column equations, we have,

$$X_j = \sum_i a_{ij}X_i + V_j \quad (j = 1, ..., n) \qquad ... \ (2)$$

where V_j is the value added by the j-th sector. These equations indicate that the value of output of each sector is equal to the total value of inputs purchased from various sectors plus the value added by the sector itself. From these two sets of equations it is easy to conclude a relationship between the input-output accounts and the National Income accounts.

If we sum all the rows and columns of equations (1) and (2) respectively, we get

$$\sum_i X_i = \sum_i \sum_j a_{ij}X_j + \sum_i F_i - \sum_i M_i \qquad ... \ (3)$$

$$\sum_j X_j = \sum_j \sum_i a_{ij}X_j + \sum_j V_j. \qquad ... \ (4)$$

From (3) and (4), eliminating the total intermediate consumption $\sum_i \sum_j a_{ij}X_j$ we get

$$\sum_i F_i - \sum_i M_i = \sum_j V_j.$$

The final demand after subtracting imports gives the gross national product which is equal to the sum of the value added by all sectors of the economy.

An input-output table may be presented in physical quantities or in money values. The physical quantity table shows the structure of actual physical outputs and will be valid for projection purposes even if relative prices of different sectors changed. In other words it is independent of the changes in relative prices. The draw-back of the physical quantity table is that it is practically impossible to give the complete picture of the economy in details and the aggregation of different commodities into a sector gives rise to additional problems. There are sectors for which the quantities are not available and the transactions cannot be shown without being represented in money values. The National Income which is the sum of the value added arising out of all sectors cannot be calculated from physical quantity tables.

These difficulties are not present when the table is prepared in money values. It is therefore a generally established practice to prepare the table in money values. However, the interpretation should also be done separately for physical units.

Furthermore, the structure can be presented at either producers' prices or purchasers' prices. The *producers' price* is the price received at the gate of the factory producing the item and consists of the material inputs into the sector and the value added by the sector. The purchasers' price is the price at which the commodities are

purchased from the market. The difference between the two prices is trade and transport margin and indirect taxes. (Hereafter these two together will be called the distributive margins).

The data of inputs are generally recorded at purchasers' price and it is easy to construct the table at purchasers' price. But the disadvantages of the system are such that it almost becomes desirable to construct the table at producers' prices. Under producers' prices the marketing costs will vary with the input structure of the sector while under purchasers' prices these will vary with the geographical and sectoral distribution of the demand for the output of the sector. (The input structure is generally more stable than the output structure). Also under producers' price system the value of each transaction corresponds more closely to the physical units than in the purchasers' price system. This is because in the latter each input includes also the distributive margin. This system will therefore be preferred to the purchasers' price system provided the data on sectorwise distributive margins are available.

The first step in the preparation of an input-output table is to divide the whole economy into various sectors. A sector is either a commodity or a set of commodities. The commodities produced and consumed are very large in number. We have to combine commodities to get sectors even if we have a highly disaggregated table of the magnitude of 500 sectors. The combining of commodities into sectors is called the aggregation of commodities. The input-output table is prepared on the basis of the assumption that each sector produces one single output, with one single input structure. All the commodities of a sector should be either perfect substitutes or the proportion of production of different commodities in the sector are expected to remain fixed. Now the problem is to decide the basis on which the commodities may be combined. Commodities having similar input structure should be combined even if they are having different uses. Similarly commodities whose outputs are likely to change in equal proportions may also be aggregated.

STUDIES IN INDIA

There is no official agency which constructs and issues input-output tables at regular intervals of time (although the importance of the subject demands it). However some studies have been made at the Indian Statistical Institute. The first of these tables was for the year 1951-52 and was published in papers on National Income Conference Vol I, Indian Conference on Research in National Income. Two more tables, one for the year 1953-54 and the other for 1955-56, were prepared by Dr. A. K. Chakraverti which are soon going to be published as part of a book entitled *Structure of Indian Economy* 1953-54. In all these three tables the number of sector was 36. These tables were prepared at market prices. More recently a table was prepared by the Indian Statistical Institute[1] for the year 1960-61 consisting of 30 sectors at producers' prices and was used for projecting the structure of the Indian economy for the year 1970-71.

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[1] Manne, Alan S. and Rudra, Ashok (1965): A consistency model of India's Fourth Plan, *Sankhyā*, Series B, Vol. 27, 57-144.

INPUT-OUTPUT TABLE 1964-65

As the table for 1960-61 became old and some of the sectors of that table were highly aggregated, it was decided to construct a table for the most recent year for which the data is available, and which is free from abnormalities like droughts etc. It was also decided to increase the number of sectors of this table. Accordingly the table for the year 1964-65 consisting of 77 sectors[a] has been prepared and which has already been used for making projections for the years 1970-71 and 1975-76. The outputs and inputs are evaluated at producers' prices of 1960-61. This table along with projections for the future years 1970-71 and 1975-76 has been published in the Material and Financial Balances, Perspective Planning Division, Planning Commission.[b] The 77 sectors of the table do not cover the whole of the economy. There are certain parts of the economy for which the direct estimates of outputs as well as the distribution of these outputs are not available have been left out of the table. These parts are such that the effects of leaving these out of the table on the economy are not of any major significance.

COMPARISONS WITH NATIONAL INCOME ESTIMATES BY CENTRAL STATISTICAL ORGANIZATION

In comparison with the National Income Estimates (white paper) prepared by the Central Statistical Organization (CSO) the input-output table does not take into account the sectors—professions and liberal art, trade and commerce, transport except railways and motor transport, house property, domestic services, banking and insurance, communications and government services. For getting the National Income estimates on the basis of this table, the value added figures for the sectors left out have been directly obtained on the basis of the white paper. The following table gives the value added figures for the year 1964-65 based on the inter-industry table as well as CSO figures. The CSO figures as given in the white paper are at 1964-65 prices. These figures have been adjusted to get the figures at 1960-61 prices, by using the relevant indices obtained from the series, given in the white paper, on current and constant prices.

TABLE I.   NET DOMESTIC PRODUCT BY INDUSTRIAL ORIGIN, 1964-65
(Rs. million at 1960-61 prices)

sectors	1964-65	
	ISI	CSO
(1)	(2)	(3)
1. agriculture, animal husbandry	70423	74410
2. forestry	2094	1500
3. mining	1910	2000
4. industries	27057	20420
5. railways	3677	4275
6. motor transport	1950	23809
7. other commerce and transport	21006	
8. profession, liberal arts, etc.	11200	11200
9. government services	15200	15200
10. house property	6100	6100
11. total	162017	157974

[a] The table is given at the end of the paper.
[b] Some minor adjustments have been made in the table as published by the Planning Commission.

The first five sectors of Table 1 are comparable with the corresponding sectors given in the white paper of CSO. Sectors 7 to 10 have been left out of our input-output table. Sector 6, motor transport, is there according to our sector classification but according to CSO, motor transport is merged with 'other commerce and transport'. The figures for sectors 7 to 10 in both the columns are based on the white paper of CSO.

For the sectors for which the two estimates can be compared, the differences are partly due to differences in the coverage. In the agriculture sector the estimate based on the input-output table is lower than that based on the white paper. This is because of two reasons—(i) we have built the estimates of the output of straw and other minor products and by-products on the basis of National Income Statistics : Proposals for a revised series for 1955-56 to 1959-60, as issued by the CSO, Government of India, 1961 (Blue Book). These estimates are lower than those of the white paper. (ii) In the animal husbandry sector dung and increment in live stock have been left out while evaluating the sector's output. If we take account of these two factors, the estimates from the two sources will nearly be the same. The difference in the case of the forestry sector is significant. This is again due to the reason that we have followed the lines of Blue Book while estimating the value of output of the sector.

The difference in the industry sector is mainly due to the fact that in the small scale sector we have taken only that part which is covered by National Sample Survey. Non-household establishments (except for a few cases where the estimates of output can be directly estimated for large scale and small scale taken together e.g. handloom cloth, gur and khandsari, vegetable oils) employing less than 10 persons if using power and less than 20 persons if not using power have been left out because of non-availability of data (details to be given later). In the case of the sector mining the estimates from the two sources broadly agree.

In the case of Railways the figure as obtained on the basis of the input-output table is less than that of the figure based on white paper by Rs. 70 crores. This is a big difference and may be attributed to the fact that according to white paper the estimate includes the value added from railway workshops and railway enterprises while according to estimates based on input-output table these have been put under industries.

SOME SPECIFIC POINTS ABOUT THE INPUT-OUTPUT TABLE

The data for the requirements of motor transport and railways as inputs into different sectors are not available. These requirements are included in the row of 'distributive margins'. The row of motor transport is kept blank for the 77 sectors of the economy. The output of the sector 'motor transport' is equal to the sum total of the earnings from goods traffic and passenger traffic. The earnings from passenger traffic is either due to travel for personal work or the travel for commercial purposes.

The proportion of passenger traffic going into household consumption is taken from Manne and Rudra (1965).[4] The remaining portion of the earnings from passenger traffic along with the earnings from the goods traffic is taken as the total intermediate consumption (including that for commerce and trade).

In the case of railways the same method is applied except for the difference that there are entries in the row for railway transport. These entries are not as inputs into the sectors under which they are put but are the requirements of railways for the distribution of the output of that sector. While taking the column total of different sectors this row is not taken into account. The entries in the row are simply given because these are used while projecting the demand for goods traffic of the railways and hence the output of railways for the year for which the projections are required. In the case of motor transport, as there are no data to get the similar row it is assumed that the total goods earnings, in the year for which projections are required, are in some given proportion to the total goods earnings of railways. This proportion is used to get the total requirements of the goods traffic for motor transport. Even though the rows are not separately shown it is necessary to keep these two sectors separately in the table because of the importance of the sectors in the economy.

SECTOR CLASSIFICATION

The sectors of this table are formed so as to get a more detailed analysis than provided by the tables previously prepared. While comparing this sector classification with that of the 30-sector table (prepared by ISI) we can say that some of the sectors of the 77-sector table are the same as that of the 30-sector table, while some of the sectors of 77-sector table are more detailed than the 30-sector table. Only in the case of construction the 77-sector table has one sector while 30-sector table has two sectors of construction. Some of the sectors of the 30-sector table are formed by aggregating commodities to an extent where the results of the prediction cannot be of much use. For instance there is one sector 'other agriculture' in the 30-sector table which consists of cash crops like cotton and jute and consumers items like fruits, vegetables and other crops. If we want to have an idea about the projection of output of say 'cotton' in some future year (say 1975-76) we cannot have it on the basis of 30-sector table and as cotton is an important crop it is necessary to have the output separately. It was therefore decided to enlarge the number of sectors so as to show the important sectors separately.

In the 77-sector matrix we have tried to get more details and have succeeded in that except for the machinery sectors and sectors on ferrous and non-ferrous metals.[5] As this matrix is prepared for being used for projection purposes and the data regarding the breakdown of the imports of machinery are not available (imports of machinery and metals form a sizable part of the total supply of these sectors), it is

decided to have only three sectors of machinery, namely, electrical equipment, non-electrical equipment and transport equipment. These sectors are the same as those of 1060-61 input-output table except for the difference that the sector non-electrical equipment of 1060-61 table is divided into two parts—non-electrical equipment and metal products. In the case of iron and steel, the sector consists of all processes starting from pig iron (for sale), and going upto castings and forgings, pipes and tubes and steel structural fabrication. According to 1060-61 table iron and steel also includes non-ferrous metals and primary products which are not there in the table for 1064-65 and are taken under the appropriate sector—non-ferrous metals. The different processes of iron and steel could not be shown separately because of the non-availability of the distribution of these processes separately. Similar is the case with non-ferrous metals.

Sector 11 of the table consists of synthetic rubber as a column and synthetic plus natural plus reclaimed rubber as a row. For balancing purpose it is shown that natural rubber is an input into synthetic rubber and is supplied by the sector 'plantations'. This is done because synthetic and natural rubber are substitutes for each other and the available data does not allow us to have the distribution of natural and synthetic rubber separately. Again the input structure of these two are entirely different. The natural rubber is kept with plantations and synthetic rubber is kept separate. The way it is done means that natural rubber supplied out of the sector plantations and the synthetic rubber taken together satisfy the balance of the total requirements of rubber.

The output of by-products according to our table have been merged with those of the main products. The sector vegetable oil includes oilseeds cakes also. The sectors foodgrains and cotton include by-products of foodgrains (straw, rice-husk and bran) and cotton seed respectively. Keeping by-products with the main products creates some confusions. The row of sector vegetable oils shows Rs. 100 crores worth of the output under animal husbandry. While looking at this huge figure one may get confused by taking the figure as the figure of oils while the actual figure is that of oil-cakes. In these cases the best method of removing the confusion is to add one more row for the by-product of each sector e.g. in the case of vegetable oils there should be a row of oil-cakes. In the column of oils and row of cakes, the entry equivalent to the value of output of cakes should be done with negative sign. This way if we add the column the value added due to cakes will be added to the sector oils. The distribution of cakes can be done in the separate row of cakes. If we sum the row, it will be zero. In this way the row of oils will be only oils and will not include cakes. This method can be applied for all the by-products and secondary products. (In the extended table under preparation this method is being applied.)

In the row 70 we have 'other materials' which are not the same as those of column 78. In row 79 these items are taken which were not given separately, and the items in this row may be any one of the 77 sectors, e.g., if an industry is consuming

any one of the sectors, say steel and the consumption is very small then in the data returns this steel may not be given separately but may be merged with 'others'. The column 78 is a residual column. The entries in this column are left over of different sectors taking into account utilization which are not absorbed by any one of the 77 sectors. This left-over may be either due to the errors of the input coefficients or due to the sectors left out of the sector classification of the table. This may also contain components of machinery required for repairs and maintenance of machines, not included anywhere else. In short there is no comparison or correspondence between the row of 'others' and column of 'others'.

METHOD OF ESTIMATION

The input coefficients are estimated by utilizing the available data in official publications and other sources. The entries in the first quadrant of the table are estimated by multiplying the values of output of different sectors with the input coefficient vector of the corresponding sector. In some cases the physical quantities of input going into different sectors are available directly (e.g. the quantity of cotton consumed for the production of cotton yarn is available from *Indian Textile Bulletin* issued by Textile Commissioner of India) from official sources. In these cases the entries are done simply by multiplying these quantities by the corresponding producers' price. In some case the entries are obtained as residues (e.g. the column of 'others'). The entries in the second quadrant are either based on different official sources or are obtained as residuals. The output levels except for the construction sector are estimated on the basis of available official statistics. The method of getting the output level of construction is the same as that used in the paper, "Estimates of gross capital formation in India" as issued by CSO.

Notes regarding the sources and methods of estimating the various flows of the table are given in the following sections.

ESTIMATION OF OUTPUT

The value of output of different sectors, except that of construction is obtained by adding up the value of output of large scale sector and small scale sector (wherever it exists). There is no provision in the input-output table for showing small scale sector separately. That is the reason why we have compared the value added due to industries arising out of the input-ourput table with that of factory establishments and small enterprises as taken from the white paper.

A sector is either a commodity (e.g. iron ore) or it covers a group of commodities (e.g. electrical equipment). In the case of sectors consisting of more than one commodity the values of output are first calculated for different commodities (small scale+large scale). The values thus obtained are added for different commodities of the sector to get the value of output of the sector. The quantities of most of the commodities in the large scale sector and some of the commodities of the large scale sector and small scale sector taken together (e.g. vegetable oils, gur and khandsari, handloom cloth,

etc.) are available from different official sources. The following are the main sources used for getting quantity figures :

    (i) *Monthly Statistics of the Production of Selected Industries of India*, Central Statistical Organization, Government of India (MSPS).

    (ii) *Annual Report*, Department of Technical Development, Ministry of Economic and Defence Co-ordination (DW).

    (iii) *Programmes of Industrial Development* 1961-66, Planning Commission, (PID).

    (iv) *Annual Survey of Industries*, Central Statistical Organization (ASI).

    (v) *Basic Statistics Relating to the Indian Economy*, Planning Commission.

    (vi) *Agricultural Situation in India*, Directorate of Economics and Statistics.

    (vii) Different commodity reports of various Ministries of the Government of India

These quantity figures are evaluated at producers' prices of 1960-61. The price used for evaluating crude oil is import price. In the case of commodities coming under the category of industries the prices are taken from ASI. There are some items for which prices are not available from ASI. For these items the prices are from DW. In the case of minerals the prices are from *Indian Minerals Year Book* (IMYB), issued by Indian Bureau of Mines. In the case of agricultural commodities we have taken the prices from 'Growth of Indian Economy' 1950-51 to 1965-66, a mimeographed paper of Perspective Planning Division of Planning Commission (GIE).

    In the case of industries sector the prices available can be utilized for evaluating the production of commodities in the large-scale sector. However some of these prices have been used for evaluating the output in the small scale sector as separate prices for commodities in the small scale sector are not available. Marginal adjustments for unspecified commodity groups or for those groups for which quantities are not available have been made in value terms only.

    The value of output of construction is estimated by following the approach of the CSO paper on gross capital formation (already mentioned). The approach is to build up the estimate by adding together the values of inputs going into construction along with the value added in construction. The inputs into this sector are obtained as left-overs of other sectors (only those items which can be absorbed by construction).

SMALL SCALE INDUSTRIES

    The large scale sector consists of those factories employing 50 or more workers if using power and 100 or more if not using power. The residual category forms the small scale sector which is again divided into two parts : (1) factories employing 10 or more persons if using power and 20 or more persons if not using power, (2) and the remaining small scale establishments. These in the following pages will be called small scale category (1) and (2) respectively.

The value of output in small scale category (1) is directly projected for 1964-65 on the basis of Simple Sector Reports of ASI (1959-63). The value of output in category (2) is based on National Sample Survey Reports (NSS) which give data regarding category (2) of small scale establishments, on inputs and outputs of various sectors. As mentioned earlier that part of the output of establishments of category (2) of small scale is not taken into account which are not household establishments.

In the case of commodities for which direct estimates of the total production (small scale plus large scale) are available from various commodity reports, the above mentioned sources are not used and in these commodities the coverage is complete.

The latest NSS report gives data regarding 1959. The growth rates for different sectors as applied to the category (2) of small scale are those of the corresponding sectors in category (1) of small scale. The details about the sources used for getting the estimates of output and also other estimates are given in the Appendix.

INTER-INDUSTRY CONSUMPTION

The inputs into any sector are obtained by multiplying the relevent input coefficients at producers' prices by the value of output of that sector at producers' price. The data regarding the costs of different inputs into any given sector are available at market prices while the inputs for the input-output table are presented in producers' prices. The difference between the two sets of prices is the trade and transport margin and the indirect taxes. As mentioned earlier the row for trade and transport margin and indirect taxes (in the table only margin is used for this term) cover the sectors railways and motor transport.

The input coefficients are first worked out at market prices. The coefficients thus worked out are then deflated by applying distributive margins to obtain the coefficients at producers' prices. The sum total of the coefficients at producers' prices is subtracted from the corresponding total at market prices to arrive at the coefficient of the distributive margin. The margin of a sector is not on the output of the sector but on the inputs of the sector and hence is to be paid by the sector itself in the form of one of the components of inputs.

As already mentioned some of the coefficients are worked out by utilising the input and output figures given in various published reports (official and unofficial). For the input coefficients which could not be worked out from the above mentioned reports use was made of ASI (1960-63) (only for sectors which come under industries). For sectors not under the purview of ASI some other sources have been utilized (as per details given in the Appendix).

The coefficients are first worked out for different commodities of a sector and then combined to get the coefficients of a sector by taking the values of output of these commodities as weights.

In cases where small scale data are available regarding inputs, the coefficients for small scale sector are separately calculated. Where small scale coefficients cannot be separately calculated the coefficients of large scale part of a commodity are assumed for the small scale part of that commodity.

For most of the sectors we are given a number of specified inputs (rows 1-77) and some of unspecified inputs are given in the form of 'others', consumable stores, materials consumed for repairs and maintenance, works done by others, postage stationery etc. and non-industrial services.

The items under the head 'others' may be one of the 77 sectors and put under this category because their details could not be collected due to one reason or the other. The definition of the item consumable stores is not clear. This could contain different components or any other materials. Materials consumed for repair and maintenance again seem to be of the form of components. The authorities publishing ASI should give the details of these items mentioned above, i.e. 'others', consumable stores and repair and maintenance. (For some of the input-output tables previously prepared these items were distributed to the specific items on the basis of their representation in the input total. This has not been done here only to tell the reader that this problem is there and can be solved by the authorities collecting data).

If these are given under specific headings the coefficients, which are not correct to this extent, can be corrected. It has been mentioned in ASI that the value 'others' is only that which could not be separated out. If this is the case at least the two other categories mentioned above can be distributed to various sectors. The item 'work done by others' cannot be distributed and as we do not have the separate output of 'work done' this will have to be kept as it is. Non-industrial services are out of the domain of the matrix. These services, if can be shown separately, (different components of services) should be separated so that if such data is available one can venture to take these sectors also in the domain of the matrix. Unless some efforts are done in this direction these residual sectors will have to be kept as they are and no balance can practically be done of these residuals.

DISTRIBUTIVE MARGINS

The distributive margins for items going into different industries are worked out on the basis of ASI data. The ASI gives the quantity and value of outputs as well as those of inputs. The values of outputs are given at producers' prices and those of inputs are at market prices. As the production figures are available in details, the corresponding producers' prices are also available (either from ASI or from some other sources). The best way of getting the inputs at producers' prices would have been to take the quantity of input from ASI and multiply it with the producers' prices, already available, and then calculate the coefficient by taking the new value of input and dividing it by the value of output as given in ASI. This method was tried but it worked well only for a limited number of homogeneous commodities. In other cases this did not work well. In some cases the margins were coming to be even negative,

That does not mean that the market price in that case is less than the producers' price. Actually the producers' price is the average price obtained by the division of total value of output, as received by all factories of the country, by the total quantity of output.

In a commodity there may be so many varieties having a wide range of price variation. The items where the market price is less than the producers' price may actually be of inferior quality and if the producers' price of such a quality is separately taken then we can be definite that the difference is due to margin. But as the required data for this is not available, this method is not practicable unless the commodity is strictly homogeneous.

The alternative adopted is to add the quantities and values of a particular commodity (say steel) going to all industries (the detailed data is available only for industries) and to work out an average market price. The difference between the producers' price and this average market price is taken as the margin and is applied for the purpose of getting the coefficients of this matrix at producers' prices and the same margin is applied to all the sectors where the particular commodity is used (we do not have separate margins for small sector).

In the case of items which are not produced in the country and the total demand is met by imports (non-competitive imports like rock phosphate, sulphur etc.) the margin is derived by taking the difference between the import price and the market price.

In the case of exports (as a column) the margin is the difference between the export price and the producers' price. We have noticed that for some of the commodities the margin is coming to be negative. Generally, custom duties are levied on exports by the government and the margin is more than the margin between producers' and market prices. In some cases to give incentive for exports and to make the prices competitive in the foreign markets, huge subsidies are given by the government. In these cases the export price may even come down to such a level that is less than the producers' price, e.g. in the case of sugar the export price is much less than the producers' prices. The difference is borne by the government.

In the case of components of machinery and machinery items themselves (as a column) there is no readily available data which can be utilized to get the margins. The 30% margin is used for the purpose (the figure was arrived at after discussions with the officials of PPD). For the purpose of completing the column of capital formation the margins are not required. The entries in this column are the sum total of the values of output and imports of capital items and these are available at producers' prices (and import prices). The margins for this column are utilized to compare the figures of capital formation with figures available from other sources. (These are available at market prices).

FINAL DEMAND OR SECOND QUADRANT OF THE TABLE

The different components of final demand are: government current consumption expenditure, exports, imports, gross fixed capital formation, changes in stocks and household expenditure. The following paragraphs explain the method of arriving at the different components.

GOVERNMENT EXPENDITURE

In the case of government consumption expenditure, no reliable data are available regarding the composition of expenditure for the year 1964-65 (and for that matter of reliability for no other year even). However, some details of the expenditure are available for the year 1960-61 from Manne and Rudra.[6] The total expenditure on government services as available from different official sources is subtracted from the total government current expenditure to obtain the expenditure on goods and services (other than government services). This expenditure is distributed among different sectors on the basis of the figures available for 1960-61. The expenditure on electricity is directly based on the data available from Central Water and Power Commission. The consumption of steel and non-ferrous metals are on the basis of "Material Balances" prepared by the Perspective Planning Division, Planning Commission. In the case of petroleum products the figures as given in the "Defence Service Estimates" (DSE) are inflated by 15% (in order to add the figure for civil consumption) to get the figure of government current expenditure. The figures as obtained from DSE refer only to the consumption for Defence. The inflated figure is nearly equal to the figure obtained on the basis of 1960-61 figures of the above mentioned paper. In the case of the sector 'Printing and Publishing' the total availability figure is divided into government expenditure and household expenditure in the ratio of 1:1 (arbitrary ratio. Some portion of this should have been kept for commerce and trade sector. This was not done because of non-availability of data). For all other sectors the basis was the above mentioned paper of Manne and Rudra. The data agiven there are based on the *Directory of Government Purchases*, issued by Directorate of Supplies and Disposal (DGS & D). This directory gives the values of orders placed for different commodities as desired by the government. The first defect in these figures is that the orders may be placed but the actual delivery of goods may be either less or more than the orders placed. Some of the goods for which the orders were placed last year may be delivered this year or some of the orders of this year may be delivered next year. As far as this defect is concerned an attempt has been made to remove it. (The 1960-61 figures are obtained after approximately removing this defect). Some past observations showed that 78% of the orders were actually delivered during the year and 22% of last year's orders were delivered this year. This constant percentage is utilized to get the figures for 1960-61. The second defect is that these orders include also the orders placed by public enterprises and do not include the expenditure of state governments. The third major defect is that some of the items of the capital nature

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have also been included. The last defect is that in some cases the orders may be placed by the government but may be of commodities for further sale to the public. The DGS & D should try to give data not regarding the values of orders placed but the data regarding the value of the commodities actually purchased. This data should be given separately for government administration and public enterprises and should separately give the items used for capital formation. If possible the items used for resale to the public should be subtracted out of the figures given. If this is done the data given may be useful for the purposes of analysis.

The 'others' under the column of the government expenditure includes the items not covered on the basis of the above mentioned sources and the margins on the items covered above.

IMPORTS AND EXPORTS

The import and export figures are taken from the March 1965 issue of the *Monthly Statistics of the Foreign Trade of India*, Department of Commercial Intelligence and Statistics, Government of India. The data given in this publication are regarding the quantities and the values of different commodities imported or exported. In some cases only value figures are given. The values given there are at 1964-65 prices. The figures required for our input-output table are at 1960-61 prices. In the case of imports the figures given in the input-output table are at CIF prices (the values in the above mentioned publication are also at CIF prices). For getting the import values at 1960-61 price two alternatives are applied. When quantities are available the 1960-61 import price calculated from the same source are applied to get the figures at 1960-61 import prices. Where quantities are not easily available (e.g. in the case of machinery), the deflater used is the index of unit value of imports of the relevant sectors. The total of imports as given in the cell of row 80 and colum 83 in the input-output table is at 1964-65 prices. The figure in the cell of row 79, and column 83 consists of the left over of imports and the difference due to the adjustments in prices. For exact comparison with producers' prices the import duties should have been added to the CIF prices but this has not been done because this will overstate the balance of payment position.

Values of exports in the input-output table are at producers' prices. In cases when quantities are available (say iron ore, tea coffee, sugar) we have multiplied the quantity exported with the producers' price of 1960-61 of that commodity.

In cases when only values are available, these have been first deflated to 1960-61 f.o.b. (export) prices and then suitable (approximate) margins have been applied to get the values at 1960-61 producers' prices. As in the case of imports the total value of exports given in the cell of row 88 and column 82 is the value at f.o.b. prices of 1964-65. The figure in the cell of row 79 and column 82 consists of the difference in the 1964-65 and 1960-61 prices, the left-over of the exports and the difference in the export prices and producers' prices.

GROSS FIXED CAPITAL FORMATION

In this input-output table only the first five sectors contribute towards capital formation—construction, electrical equipment, transport equipment, non-electrical equipment and metal products. In the case of construction the entire value of output is allocated between capital formation and 'others' (col. 78, row 1). The figure under 'others' is mainly construction of the type, repairs and maintenance of the existing construction, which is not available separately for different sectors (which need construction). The value of repair and maintenance and other works not forming capital is given, in the paper on capital formation by CSO for a series of years upto 1961-62. This value is projected to get the value for the year 1964-65 and put under 'others'. The output value of construction minus the figure for 'others' is taken as the contribution of this sector towards capital formation.

The demand for capital formation for the output of the sectors electrical equipment, non-electrical equipment and transport equipment are worked out on the basis of commodity composition of the sectors. The total supply of these sectors available for internal consumption is distributed among household consumption, capital formation and 'others'.

In these sectors the items are either finished products or components. In the cases of finished products some of the items are used entirely for capital formation and some are distributed between household consumption and capital formation. The items in the second category are mainly consumer durables. A part of the consumer durables may also come under capital formation. In other words these are partly capital goods e.g., an electric fan used by an individual for his personal use is considered to be a consumer durable while the fan used in some commercial establishment will come under capital formation. However, in the absence of any data regarding the distribution we have put consumer durables under current consumption (household or government). This way, there is under estimation of capital formation and overestimation of household expenditure of these items.

In the case of components it is assumed (the assumption is based on CSO paper on capital formation) that 50% of the components will go into capital formation in the form of renewals and replacements. The remaining portion of components left over after utilization in the current production of capital goods are put under 'others' against the relevant sectors. These 'others' are actually those components which are used for the repairs and maintenance of capital stock and which do not add to the capital stock.

In the case of metal products, the figure of capital formation from organised sector is based on the commodity composition of the sector. The figure of small scale sector is worked out by utilizing the ratio of items under capital formation to the value of output of the sector, the ratio being taken from the above mentioned paper of CSO on capital formation.

CHANGE IN STOCKS

It is not necessary that the total production of a particular commodity during a particular year will be consumed during the same year. The difference in the production of a commodity and its consumption during the same time period is taken as the changes in the stocks already existing at the beginning of the period. The stocks are either with producers, or wholesalers or with the retailers. The change of stocks may be with any one of the above mentioned three categories. There is no data which gives the changes in stocks with the retailers or wholesalers. The figures regarding the changes in stocks are only available with the producers (that too not for all commodities). These are published in the MSPS. To get the column of change in stocks of our table, use has been made of the MSPS. It has been assumed that there will not be any change in stocks either with the wholesaler or with the retailer. The quantity figures of change in stocks as available from MSPS are multiplied with the producers' prices to get the value for the sector. These available stocks are only for the large scale sector of industries. There are some sectors for which the changes in stocks are available from some official reports. In the case of foodgrains only the stocks with the government have been considered and these are available from *Food Statistics of India*, Directorate of Economics and Statistics. The stocks of cotton yarn and textiles and also of other kinds of textiles are available from *India Textile Bulletin* issued by the Textile Commissioner. The stocks for cotton and jute crops are available from the official reports of DE & S. In some cases, when the output of any particular sector is left over after its distribution into some specific sector and we know that there is no other use of the sector, the residual has been taken as the change in stocks.

HOUSEHOLD CONSUMPTION AND 'OTHERS'

The methods of getting the household consumption figures and also the figures for 'others' for sectors 2, 3 and 4 have already been discussed in the section on capital formation. In the case of sector 5 the left-overs after deducting for all other uses except household and 'others' is distributed between these two on a very rough basis.

The items of household consumption under this category are mainly domestic utensils, steel furniture, metal containers. Some rough estimates of the outputs of these items are available. Using these estimates and the household consumption figure given in the paper of Manne and Rudra (already mentioned), the figure of household consumption of this sector is worked out and the remaining portion is put under 'others'.

The sectors 6 to 8 are blank as far as household consumption and 'others' are concerned. In sector 9 'others' is based on the Requirements of Maintenance Imports prepared by PPD. In sectors 13 t 19 and 21 to 31 the household consumption is on the basis of residual method. In sectors 20 and 21 the left-over of vegetable oils and vanaspati respectively are divided into two parts—household consumption and 'others'. The 'others' is the consumption in restaurants etc. In sector 32 the household is residual. The extra factory consumption of cotton is taken from 'Cotton in India' and the estimate is therefore direct. The corresponding figure for jute is from Jute Statistics. The household figures for sectors 35 to 44 (except 36) are on the basis

of the residual method. In the case of sector 45 (oilseeds), the figures of coconuts, copra (which are the main consumption items) are based on PID while in the case of groundnut a certain minor portion is kept for household consumption, and whatever is left over after this is put under 'stocks.

The household consumption of sugarcane is derived on the basis of the Sugar Enquiry Commission Report—October 1965, Ministry of Food and Agriculture, Government of India (SCC). The report gives the requirement for chewing and as seed. The seed figure is taken from the Blue Book and the remaining figure is put under household consumption. The figure for direct consumption of tobacco is available from 'Tobacco in India' by DE&S. The figures for sectors 48,49, 52 and 53 are on the basis of the residual method. In the case of sector 57 the residue after other uses is distributed equally into two parts (arbitrary distribution) and put under household consumption and 'others'. The household and 'others' figures for sectors 58 and 78 have already been explained. In the case of sector 59, the whole of kerosene oil and portion of motor spirit being used for cars, scooters etc. is taken under household consumption, 'others' is on the basis of the residual method. The whole of the production of sector 61 is for household consumption (rubber footwear). Tyres and tubes under household are those mainly used by bicycles and cars. The 'others' is a residual figure. The sector 63 is other rubber products. It consists of some household consumption items and some items which are used by almost all industries but the consumption of these items as a proportion of the total consumption is minor (upto the extent that it is not separately mentioned). One example is rubber hoses and belts. Such items are put under 'others' and the remaining under household consumption. The sector 64 is paper and paper products. The left-over after intermediate consumption is divided into household consumption and 'others' arbitrarily. While distributing such sectors into household and 'others' use is made of the paper 'Preliminary Estimates of Consumption Expenditure' by S. M. Kansal (a discussion paper of ISI). The distribution of sector 65 into household and 'others' is on the basis of components of the sector. 'Others' of sector 66 is on the basis of the residual method. The household consumption of sectors 69, 70 and 71 is on the basis of residual method. In sector 72 the 'others' is on the basis of residual method. In the case of sector 74 the private consumption of electricity is available separately and that of commerce etc. is also available. The former is put under household and the latter under 'others' (after multiplying, with suitable prices). The household consumption of sector 75 is on the basis of the above mentioned paper by Manne and Rudra. The whole of the production of sector 76 is taken under household consumption. The figure for sector 77 has already been explained.

The figure in the cell of row 86 and col. 80 consists of the left-over of the household consumption and also the aggregated difference due to distributive margins. The entry in the cell (row 86, col. 84) is only due to distributive margin.

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Appendix

This appendix gives the notes regarding different sources used for getting the relevant data. For this purpose some of the sectors have been kept as they are and some have been grouped together. The following is the groupwise discussion for the purpose.

Electrical equipment. This sector consists of different items of power machinery and also light electrical machinery. Air conditioners, refrigerators and water coolers are also included in this sector. The quantities for transformers, electric motors, electric fans, storage batteries, dry cells, cables, conductors and winding wires, radio receivers, airconditioners and water coolers are from MSPS. Prices of the above mentioned items, except for transformers and electric motors, are from ASI. The prices for transformers and electric motors are from DW. In the case of telephone equipment and telegraph equipment values are estimated directly on the basis of ASI (1960-63). Value of output of control-gear and switch-gear is from GIE.

Some of the above mentioned items are produced also in the small scale sector. The value of small scale output of control-gear and switch-gear is based on the Analysis and Planning Report (APR) 61, by Development Commissioner, Small Scale Industries, Ministry of Commerce and Industry. The figure given there is for the year 1959, the growth rate of large scale sector is applied to get the figure for 1964-65. The small scale production of electric motors is based on the 'Report of Continuance of Protection to Electric Motors' by Tariff Commission. The small scale production of electric fans, radio receivers and storage batteries are based on PID. The total value output of small scale sector is obtained from the Sample Sector Reports (SSR) of ASI (1960-63). The output of small scale sector of the specified items is subtracted from this total to get the residual to be put under 'other electrical equipment'. The distribution of this small scale sector total output into different components is required for the purpose of calculating input coefficients. The output of components of these items (wherever these are there) are based on ASI for large scale sector and various APR reports for small scale sector. It is assumed (which may not be a correct assumption) that there is no production of electrical equipment in the small scale sector category (2).

The input coefficients are first calculated for different items mentioned above (small scale+large scale) and then combined into the coefficients of the sector, electrical equipment. The input coefficients are calculated at market prices by utilizing the data given in ASI except for some coefficients for which some other sources are utilized. The steel coefficients into transformers, electric motors and electric fans and lead and antimony (nonferrous metals) into storage batteries are based on PID. In the case of radios and dry cells, it is assumed that 1/2 of the 'others' will be components. This is done because there are lots of components consumed by these two sectors which are mentioned in PID but not separately given in ASI. That means a good proportion of 'others' comes out of small components. In the absence of any other information this arbitrary ratio is applied. The coefficients of the small scale sector output of various components are taken to be the same as those of the corresponding components of the large scale sector.

Transport equipment. This sector consists of equipment for railways, motor vehicles, bicycles, ships and aircraft. In this sector there is huge repair work which is also taken into account. In the case of aircraft only repair services have been taken into account. The manufacturing activities have been left out because of non-availability of data. The quantities as well as prices for locomotives, wagons, passenger coaches and ship building are

taken from GIE. The quantities of production of all kinds of motor vehicles and bicycles (large scale) are from MSPS. The prices of these items are from ASI. The value of repair works of different components of the sector are based on ASI. The value of output of automobile ancillaries is based on 'Report of the Working Group on Transport Equipment by Planning Group on Machinery Industries.' Fourth Five Year Plan. The production of bodies for motors and trucks and diesel engines produced in addition to the self requirement of the producers are also included in the sector. Some of the diesel engines and bodies for motors and trucks are purchased by the Government, and some by factories which do not produce diesel engines and bodies for motors and trucks themselves, but purchase these from the market. The remaining portion goes to capital formation.

In this sector the small scale output is assumed to be only of bicycles and parts of bicycles. The small scale output of cycles is based on Tariff Commission Report on bicycles. The output of bicycle parts is based on the APR on bicycles which gives a very rough idea about the production of parts.

The coefficients of the different commodities of the sector are based on ASI except some coefficients for which individual sources are mentioned. In the case of locomotives the steel coefficient as given in ASI 1960 is reduced proportionately by taking into account the production of diesel and electric locomotives which were not being produced in 1960-61. The components for electric and diesel locomotives are mostly imported. In 1964-65 the import of components of diesel and electric locomotives was more than the output of these type of locomotives. It seems that the components in 1964-65 were imported for production in 1965-66. Therefore it is assumed that only a portion of components, equal to the import of components in 1963-64, plus the output of components in 1964-65 is consumed for 1964-65 production of locomotives. The difference in the imports of components between 1964-65 and 1963-64 is taken as the change in stocks.

In the case of motor vehicles the storage battery coefficient is based on the assumption that one vehicle requires one battery (PID). The components coefficient for motor vehicles and also motor cycles and scooters is based on the Report of the Working Group (already mentioned). The tyres and tubes coefficient is based on the assumption of tyres and tubes per vehicle as given in PID. In the case of the sector transport equipment the row of the sector and the column of 'others' consist mainly of repair work of air and shipping transport which are not part of the domain of the input-output table.

Non-electrical equipment. This sector consists of all items of machinery which are not covered above. The output levels of different kinds of machinery are available in value terms only except for a few items : diesel engines (stationary), power driven pumps, ball and roller bearings, tractors and sewing machines. The value figures as well as quantity figures are from MSPS for most of the items. There are some items for which the production figures are not available from the above mentioned source. These are based on ASI (1960-63). The component figures except for component of textile machinery, are also based on ASI (1960-63). The components of textile machinery are based on the Report of the Working Group on Textile Machinery (including from small scale sector). There are some items which are manufactured in the small scale sector. The output of these items is based on PID or APR reports. The prices of these items for which quantity figures are available are based on ASI except for that of tractors which is based on GIE. The other non-electrical equipment is exactly on the same basis as that of other electrical equipment.

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The input coefficients of different commodities of the sector are based on ASI except for the tyre and tube coefficient for tractors which is on the basis of 4 tyres and 4 tubes per tractor.

Metal products. There are products of metals which do not form part of the machines. The important items in this category are domestic utensils, metal containers, bolts nuts and rivets, hand tools and small tools and metal furniture. Quantity figures are not available for most of the items of the sector. Our calculation of the output of this sector in the case of large scale factories is based on Volume VII of ASI except for items for which quantity figures are available. The quantity figures for such items are either from MSPS or DW and the prices in these cases are from ASI. The values of different items of Volume VII of ASI are available for 1960-63. These are projected to get the figures for 1964-65 (item-wise projections are done). The corresponding figures of small scale category (1) are on the basis of Sample Sector Reports of ASI. The figure for small scale category (2) is based on Draft National Sample Survey (NSS) report No. 68 which gives the figure for 1958-59. This figure is assumed for 1959 and the growth rate of small scale category (1) is applied to get the figure for 1964-65 of category (2).

The input coefficients are separately calculated for the large scale sector and small scale sector. The coefficients in the case of large scale sector are based on ASI. The coefficient in the case of category (1) of small scale, are based on Sample Sector Reports of ASI and of category (2) are based on the above mentioned report of NSS. These reports give value added, depreciation, fuel and lubricant, and total raw materials consumed. In the case of raw materials the total coefficient as obtained on the above mentioned method of small scale sector is distributed nto different components on the basis of additional available information. The inputs of steel are based on the allocation to small scale industries given in the Report of the Working Group on Small Scale Industries. The coefficient of copper into small scale is also based on this report. The aluminium for small scale sector is based on PID. Other metals like zinc and lead are based on material balances supplied by PPD. The other coefficient of specified items into small scale sector are the same as that of large scale sector. These coefficients thus derived are subtracted from the total input coefficients and the residual is put under 'others'.

Iron and steel. The sector consists of pig iron (for sale), semi-finished and finished steel castings and forgings, pipes and tubes, ferro alloys and steel structural fabrication. The quantity figures for pig iron, semi-finished steel and finished steel are from MSPS. The same figures for castings and forgings and steel structural fabrication are from DW. The prices except for castings and forgings are from ASI. The price of steel castings and forging is from GIE. There is iron castings in the small scale sector, the output of which is based on PID. The coefficients of castings and forgings, pipes and tubes and steel structural fabrications are all based on ASI. The major input coefficients like iron ore, coal and coke, limestone etc. are based on Steel Statistics of India by Hindustan Steel Private Ltd. The other coefficients are based on ASI. Similarly the coefficient of manganese ore for ferro alloys is on the basis of *Indian Minerals Year Book* (IMYB) and other coefficients for ferro manganese ore from ASI.

Non-ferrous metals. This sector covers ingots of various non-ferrous metals and their primary products as well as alloys of metals. The quantity figures are from MSPS and the small scale production is on the basis of Sample Sector Reports of ASI. The input coefficients except that of minerals are from ASI. The minerals coefficients are based on IMYB.

Minerals. There are four sectors in this group. The sectors are iron ore, coal and coke, crude oil and other minerals. The quantities as well as values of all the items except coke and crude oil are from IMYB. The quantity of coke is based on Coal Statistics by Coal Controller. Only a small quantity of coke prepared by steel plants is taken into account. The coke utilized by the plants themselves is not taken here. The price is from ASI. The quantity of output of crude oil is from Monthly Abstract of Statistics published by CSO. Import price of crude oil is used.

The detailed input coefficients for minerals are not available. The IMYB gives the value of output as well as net value added and depreciation for all the minerals. The difference is taken as the total inputs consumed. The electricity coefficients into minerals are based on the Material Balances prepared by PPD. Other coefficients applied here are the same as those given in the paper by Manne and Rudra (already mentioned).

The input coefficients into coke except for coal and minerals are based on ASI. Coal and minerals coefficients are based on IMYB.

Cement. This sector consists of cement and cement products like cement sheets, etc. The quantity of cement and asbestos cement sheets are from MSPS and the prices are from ASI. The value of output of other cement products is based on ASI (1960-63).

Leather and leather products. This group covers sectors 12 to 14. A major portion of the production of leather is from unorganised sector for which no reliable data is available. PID gives the production of the year 1960-61 and estimate of output for 1965-66. The figures for 1964-65 are interpolated. The price of large scale portion of hides is on the basis of ASI while the price of small scale is based on the Analysis and Planning Report on Leather. By utilizing these two prices the average prices of tanned hides as well as tanned skins are worked out. The main input into leather is hides and skins (raw). This coefficient is worked out by taking one raw hide for one tanned hide and one raw skin for one tanned skin. The other coefficients are based on ASI.

The bulk of production of footwear comes from small scale sector for which no reliable estimates of production are available. The source of the production of footwear (and its reliability) is the same as that of leather. The footwear price is from ASI. This price is used for the entire production as no separate price is available for small scale production. The main input into the sector is leather which is based on PID. Other coefficients are on the basis of ASI.

The output of the sector 'other leather products' is worked out on the basis of the leather available for other leather products, after subtracting the leather consumption into footwear from the total availability of leather. The coefficients of this sector are based on NSS Report No. 68 which gives fuel and lubricants, raw materials, auxiliary materials, etc. The total of raw materials is assumed to be leather which overestimates the coefficient of leather but as no more details are available this has been done.

Rubber. This sector as a column covers only synthetic rubber. Input coefficients are based on the data available in PPD material balances. The quantity and value of output are from GIE.

Animal husbandry. The output levels of meat, milk, wool, eggs and hides and skins are from GIE. The value of output of other items of animal husbandry like horns and hoofs and other meat products is on the basis of Blue Book. Dung and increment of livestocks have been left out of the sector. The input coefficients are based on Blue Book which gives the

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inputs into the agriculture and animal husbandry sectors separately. As the major part of the consumption of foodgrains (as feed), cotton seed and oil cakes are for milking animals, in the absence of any data, it has been assumed that the whole of the feed of foodgrains and oil cakes will go to animal husbandry. This will in a way overestimate the coefficients, and similar coefficients which should have been represented in other sectors of agriculture are not represented. But the balance of the sector will not be affected. In distributing remaining portion of the feed between animal husbandry and other agriculture sectors subjective judgement is used in addition to the information available in the Blue Book.

Food industries. Sectors 16 to 22 and 24 to 31 are covered by this group. The details regarding the data requirements are discussed below.

1. Flour milling : This sector consists of rice and wheat milling. The quantities of wheat-flour are taken from MSPS and those of rice milling are based on ASI (1960-63). The prices are from ASI. There is lot of milling done in the small scale sector. The output figures (value only) of grains milled for small scale sector category (1) are based on the sample sector reports of ASI. There is no data available regarding the output of category (2) of small scale. Therefore it has been left out of our calculations.

The input coefficients are based on ASI. While converting the market price coefficient of wheat into wheat-flour the difference taken is between the import price and the market price. This is done because generally the wheat flour of large scale sector is out of imported wheat.

The quantity of output of sugar is based or MSPS and the price is from ASI. The input of sugarcane into sugar are based on Sugar Enquiry Commission Report (SECR). All other input coefficients are based on ASI.

The sector plantation consists of processed tea, cured coffee and rubber. The quantities of output of tea and coffee are from Basic Statistics Relating to Indian Economy, Planning Commission (BSRI). The quantity of output of rubber is from GIE. The price of coffee is obtained by assuming the wholesale price ratio between tea and coffee to be the same as for producers' prices. (The ratio is taken from Index Number of wholesale price issued by CSO). The price of rubber is from GIE. The input coefficients used are those used by Manne and Rudra (already mentioned).

The quantity figure of gur and khandsari is based on SECR. The price is also based on this report. The input of sugarcane into gur is based on SECR. Other coefficients are based on ASI (with some adjustments). The output of molasses and baggase have been added to gur. These output are based on SECR. The value added in gur is coming to be very low. This is because of the fact that after the gur is extracted out of sugarcane, the remaining portion, called sugarcane tuft, fetches quite a significant amount. This according to our sector classification (also that of Blue Book) goes to 'other crops'. That means a portion of the value added by the sector gur and khandsari is transferred to other crops.

The sector vegetable oils consists of oilcakes also. The quantity figures for major oils and oilcakes are derived on the basis of the figures given in Agricultural Situation in India : October, 1964. This publication gives the quantity of production of different oil seeds, quantity of oilseeds crushed, the oils and cakes extracted out of these seeds. The figures given there are for the year 1962-63 and a few preceding years. The ratios of 1962-63 are applied to the 1964-65 production of oils. Although a major portion of oils is produced in the small scale sector, the prices of ASI are applied in the absence of prices for the small

scale sector. The quantities of production of minor oils and cakes except for coconut oil and cotton seed oil are based on 'Oilseeds in India' by DES. The quantity of production of coconut oil is obtained by using the ratios given in PID. In the case of cotton seed oil the production of large scale sector are from MSPS and the small scale sector for 1960-61 is from PID. The growth of large scale sector is used to get the figure of small scale sector for the year 1964-65. The prices of minor oils and cakes are also from ASI.

The major item of input is oil seeds, the coefficient for which is worked out by utilizing the ratio of seed crushed to that of oils and cakes produced. Other input coefficients are based on ASI.

The output figure of Vanaspati is from MSPS and price is from ASI. The utilization of oils for the production of Vanaspati is obtained from the Directorate of Sugar and Vanaspati. Other coefficients are based on ASI. The quantity of production of salt is from MSPS. The price and the coefficients are from ASI.

The sector 24 is milk and also includes other miscellaneous products. In the case of this sector only that part of the production is taken which is produced by the large scale sector. The small scale production is left out as no data is available for the small scale output. The quantities of different components of the sector are either from DW or from ASI. The prices as well as input coefficients are from ASI.

The major portion of the sector is milk products. This item is taken here because this is important from the investment point of view.

The production of breweries and soft drinks etc. are from organised as well as unorganised sectors. The figures of organised part of the sector are either from DW or from ASI. The figures for unorganised part are very rough and are based on the Draft NSS Report No. 21. The coefficients are for organised part only and are from ASI.

The sector number 26 consists of biscuits, confectionery and other bakery products. The quantities of output of biscuits and confectionery are from MSPS and prices from ASI. The value of output of bakery products is based on ASI. The small scale production is based on Draft NSS Report No. 21. The coefficients are based on ASI.

The output of cigarettes is from MSPS and the price is from ASI. The consumption of tobacco is taken from Tobacco in India. All other coefficients are based on ASI. Bidi is mainly produced in the small scale sector : the production of bidi is derived by taking the tobacco consumed by the bidi industry (given in Tobacco in India) and making use of the production of bidi and consumption of tobacco of the large scale. The input coefficients of large scale are used.

The production of other tobacco products is again derived by the same method as used in the case of bidi. The tobacco consumed by this sector is derived by subtracting the other uses of tobacco from the total availability. The coefficients are based on ASI.

The output of fruits and vegetable preservation and cashewnut processing are taken from the Report of the Study Group, Export Sector of Agricultural Commodities and Agriculture Based Industries (REAC). The prices and the input coefficients are from ASI.

The output of starch is taken from the *Indian Textile Bulletin* by the Textile Commissioner. The input coefficients are based on ASI.

Agriculture. The quantity figures of production of major items of the sectors under agriculture (foodgrains, cotton, jute, oilseeds, sugarcane, tobacco) are available from the Directorate of Economics and Statistics. The prices of these items are taken from GIE

(supplied by CSO to PPD). The sector foodgrains according to our classification consists of foodgrains, straw and rice husk and bran. The ratios of the production of straw and rice husk and bran to foodgrains are taken from Blue Book and applied to get the production figures of straw and rice husk and bran for the year 1964-65. The sector cotton includes cotton seed also. The production figures of cotton seed are given in *Cotton in India* upto the year 1962-63. The production figures for 1964-65 are obtained by relating it to cotton seed production after requirement being fulfilled for seed of cotton and for extracting oil is taken as the consumption of cotton seed into animal husbandry.

The sector oilseeds consists of major oilseeds plus coconuts and minor oilseeds. The production of coconuts is available from the Directorate of Economics and Statistics. The production figures for minor oilseeds are taken from REAC.

The sector jute consists of jute, mesta, sanhamp and sisal and other vegetable fibres. The production figures are available from Directorate of Economics and Statistics.

The regular estimates of the production figures for all the fruits and vegetables as well as other crops are not available. There are some items of the sector fruits and vegetable for which the estimates of production are available from DES (e.g. potatoes, cashewnuts, banana, tapioca). The value of output of these specified items are taken and the remaining items are taken as 'other fruits and vegetables'. The value of these items is taken from GIE. The items under 'other crops' are : fodder crops, grass and other unspecified items. The production of these items are obtained by applying the growth rates of corresponding main products; the base figures are taken from the Blue Book.

The production (quantity and price) of silk is taken from 'Indian Silk' by Silk Board.

The sectors of agriculture are such that even by putting the same inputs for two years we may get different outputs. The output of these sectors depend on many external factors like rains etc. Therefore the concept of input coefficient does not hold good in agriculture sectors. However, some rough idea of the requirements can be had and the coefficients for that have been worked out. Seed rates for different crops are available from the Blue Book. No distributive margins are applied to seed coefficients i.e., the seed coefficient at producers' price is the same as for market prices. The requirements of fertilizers are not available crop-wise. A rough distribution is done on the basis of the Report of the Committee on Fertilizers by the Working Group on Manures and Fertilizers (Srinivasan Committee Report). Straw, rice husk and bran and other crops (grass and sugarcane tuft etc.) and other input coefficients are distributed among different crops on the basis of the value of output of these crops. These input coefficients for agriculture as a whole are based on Blue Book. In the case of silk the coefficients are based on the Report of the Working Group on sericulture (IV-th Plan).

Textiles. The sectors under this group are 34, 35, 37, 38, 39, 41, 43, and 44. The output figures for the large scale portion of cotton yearn (34), cotton textiles—mill made and handlooms (35), are from MSPS. The figures for unorganised spinning (Amber Charkha) and cotton textiles—khadi are available from the Khadi and Village Industries Board.

The jute textile output figures are from MSPS. The sector jute textile includes also coir products which is based on the Annual Report of the Coir Board. The production of silk textiles for 1962 is from *Indian Textiles Industry* 1965 by M.P. Gandhi (ITI). The production for 1964-65 is derived by relating it to the production of silk and silk waste (sericulture Report). The production figures for woollen yarn and textiles are from the *Indian Textile Industry* by Textile Commissioner.

The production figures for Art Silk Yarn and Art Silk fabrics are also from *Indian Textile Industry* by Textile Commissioner.

The items not covered by the above mentioned textile products are put under 'other textiles'. The large scale part of the production is based on Volume III of ASI and clothing, tailoring and umbrella manufacture from Volume IV of ASI.

The sample sector category (i) is based on Sample Sector Reports of ASI. The clothing and tailoring part of category (ii) of small scale production are based on NSS Report No. 42. The remaining portion of the other textiles of this category is based on Draft Report No. 21 of NSS.

The input coefficients of these sectors except 'other textiles' are from two kinds of sources. The main raw materials of these sectors are available from either the Textile Commissioner's report or the individual commodity reports. The cotton into cotton yarn and the consumption of cotton yarn by mills and handlooms is available directly from *Indian Textile Industries*. The input of jute and mesta into jute textile is available from Jute Statistics by DE & S. The coefficient of wool into woollen yarn and woollen yarn into woollen textiles is derived from the basis of the relations given in PID. The input of silk into silk textile is derived from ITI by M. P. Gandhi. The input of Art Silk Yarn into the art silk fabrics is based on the availability of the yearn during the year and the production of fabrics. All other coefficients are based on ASI. In the case of 'other textiles' all the coefficients are based on ASI.

Fertilizers. The production figures are from Fertilizer Statistics. The prices and the coefficients are from ASI. As there is no production of rockphosphate and sulpur in the country, import price is used for deriving the margins and these coefficients are at import prices, not at producers' prices.

Bricks, ceramics etc. The quantity figures of the production for the large scale sector of different components of the sector are from MSPS and ASI (which are not available from MSPS). The small scale category (i) is based on Sample Sector Reports of ASI. The production of category (ii) is based on Gross Capital Formation paper of CSO. The CSO paper gives the figure for 1960-61; the growth rate of large scale sector is used to get the figure for 1964-65. The input coefficients are based on ASI except that of coal for which the Material Balance of Coal prepared by PPD is used.

Glass and glass ware. The quantities of production are from MSPS and prices are from ASI. The small scale category (i) is on the basis of Sample Sector Reports of ASI, while that of category (ii) is on the basis of Draft Report No. 21 of NSS. The coefficients are all on the basis of ASI.

Wood products. The basis for the output of the large scale portion are MSPS and ASI. The Small Scale Sector (i) is on the basis of Sample Sector Reports of ASI. The second category of small scale is based on NSS Report No. 68. The coefficients of organised portion are based on ASI while for small scale categories (i) and (ii) are on the basis of Sample Sector Reports, ASI and NSS Report No. 68 respectively. In the case of Small Scale it is assumed that the total raw materials input is that of wood.

Chinaware and pottery. The production is based on the Report of the Working Group for Village and Khadi Industries, Fourth Five Year Plan. The coefficients are based on ASI.

Forestry. The sectors under this group are 54, 56, 57. The output levels for recorded output are based on Indian Forest Statistics and for unrecorded output are on the

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basis of Blue Book. No detailed coefficients are available. Blue Book says that 5% of the value of output is material input which in the absence of details is put under 'others'.

Motor transport. The value of output of this sector is equal to the earnings from passenger and goods traffic. The figures are taken from G1E. The input coefficients are based on the Report of Public Sector Undertakings 1960-61.

Petroleum products. The physical quantities of output of petroleum products are from MSPS. The price used is from G1E. The crude through put into petroleum products is based on the Indian Petroleum Hand Book 1964. Other coefficients are from ASI.

Rubber products. This group covers sectors 61, 62 and 63. The output figures in quantities, of sectors 61 and 62 are from MSPS. The prices are from ASI. The large scale portion of sector 63 is based on ASI and the small sector category (i) is on the basis of Sample Sector Reports of ASI. It is assumed that there is no production of rubber products in small scale category (ii). The coefficients are all based on ASI.

Paper and paper products. The quantities of specified items like paper and paper boards, newsprint, etc, are from MSPS. The prices of these items are from ASI. The values of unspecified items are based on ASI. The small scale production is on the basis of Sample Sector Reports of ASI. All the coefficients are based on ASI.

Railways. The output figures in this case are the earnings of Railways. The figures of output as well as inputs are based on the Report by the Railway Board.

Electricity. All the figures are based on Public Electricity Supply : All India Statistics.

Matches. The quantity figures are from MSPS. The prices and coefficients are based on ASI.

Printing and publishing. The figures of output of large scale portion are from ASI (1960-63) and for small scale from Sample Sector Reports of ASI. The coefficients are based on ASI.

Man-made fibres. The quantity figures of production are from *Indian Textile Bulletin* (1965). The prices and the coefficients are from ASI.

Chemicals. This group covers sectors 65 to 72. The sector 65 (plastics) consists of plastics as well as the products of plastics. The sector 72, miscellaneous chemicals, covers all inorganic and organic chemicals which are not covered by sectors 65 to 71. The names of the sectors 66 to 71 are such that the name clearly indicates the item covered by each sector. The quantities of output of the above mentioned sectors (and different items in these sectors) except for soap and drugs and pharmaceuticals are from MSPS. The production of soap is based on PID which gives the approximate quantity of production of soap in the organised as well as unorganised sector. The value of production of drugs and pharmaceuticals of the organised portion is based on ASI and value of small scale is assumed to be 25% of the organised sector. (Report of the Sub-Group on Small Scale Industries: July 1965).

The prices as well as input coefficients are based on ASI.

Dye-stuffs and paints and varnishes figures for small scale are from Report of Protection on Dye-stuff Industries of India and PID respectively.

In sector 72 there are some specified items for which production is available from MSPS. The production of the remaining unspecified items is based on ASI (1960-63).

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