

CHAPTER IX

TRANSPORT, STORAGE & COMMUNICATION

Coverage

9.1. The economic activities covered in this industry are (i) transportation by railways, viz., government and non-government, (ii) transportation by other means, viz., road transport (mechanised and non-mechanised), water transport (coastal, ocean and inland), air transport and services incidental to transport, (iii) storage and (iv) communication services rendered by the Posts and Telegraphs Department (P&T) and overseas communication service. The budgets of railways and communication services however include allied activities which according to standard classification should belong to respective industries. Following this principle railway workshops and railway manufacturing establishments like Chittaranjan Locomotive Works, Integral Coach Factory etc., are excluded from railway transport and included in the manufacturing industry. Construction activity of railways is also excluded and taken into account in the construction industry. Similarly, the activities of the P & T Department relating to post office savings bank and postal life insurance are excluded from communication and included respectively in the banking and insurance industry.

Methodology & Source Material

9.2. Estimates of gross/net value added are prepared by following the income approach.

Estimates at current prices

Railways

9.3. The principal sources of data are the *Annual Report and Accounts and Annual Statistical Statements*, brought out by the Ministry of Railways (Railway Board)³⁸, *Appropriation Accounts of Railways in India*, and budget documents of the central government on railways³⁹.

9.4. Compensation of employees of government railways including railway construction and manufacturing establishments and workshops are available from the annual reports. Interests received by central government from the railways is obtained from the accounts of the central government. Profit is estimated by deducting from the receipts of railways the working expenses, payments to works lines, expenditure on policy formulation and research and other miscellaneous expenditures of similar nature as well as interest payments. The sum of compensation of employees, interest and profits gives

estimate of net value added which is then obtained by making adjustments for railway manufacturing establishments, railway workshops and also for the construction activity undertaken by railways. These adjustments are worked out on the basis of information contained in budget documents and details in ASI report which also cover railway workshops. Consumption of fixed capital is assumed to be equivalent to works expenditure met from depreciation reserve fund less expenditure on improvement of assets replaced and this expenditure is also obtained from the same sources. The value added estimate in respect of non-government railways is compiled from the data on working expenses and net earnings available in the Indian Railways *Annual Statistical Statements* (Railway Board, Ministry of Railways). It is assumed that the share of compensation of employees in working expenses forms the same proportion as in the case of government railways. The net earnings of non-government railways is taken to represent the profits.

Transport by Other Means

9.5. This covers all transport services other than railways and are estimated separately under the broad categories listed above. Estimates of gross/net value added in case of public sector are obtained by economic analysis of annual reports for non-departmental undertakings and budgets for departmental undertakings. In case of private sector, the approach followed is to estimate total value added as the product of value added per worker and the number of workers engaged in each activity. The value added per worker for each type of transport service is based on survey results of similar public sector undertakings (Appendix 9.1). The number of workers for the base year (1970-71) is obtained using corresponding population census results for 1961 and 1971, and for subsequent years by using relevant annual indicators to carry forward the base year figures.

Public sector estimates

9.6. Public sector transport services include not only passenger transport by bus and trams, ocean and inland water transport and scheduled air services but also the supporting services to water and air transport. The more important categories of supporting water transport services are operation and maintenance of piers, docks, pilotages and light houses and similar services in case of air transport are operation

³⁸ Contains comprehensive statistics on all important aspects of the working of government railways and also some basic data in respect of non-government railways.

³⁹ Contains (i) Budget of the railways—revenue and expenditure of the Central Government, (ii) the demands for grants for expenditure of the Central Government on the railways, (iii) works, machinery and rolling stock programmes of railways, and (iv) explanatory memorandum on the railway budget.

of air ports, flying facilities, radio beacons, flying control centres, radar stations etc. The annual reports of all public sector transport undertakings (e.g. State Road Transport Corporations/Companies, Shipping Corporation of India, Mogul Lines, Central Inland Water Transport Corporation, Dredging Corporation of India, Air India, Indian Airlines etc.) are analysed to obtain the estimates of gross/net value added. For the supporting services like port trust, light houses, etc., similar relevant materials available from the budget documents of the concerned ministries are analysed.

Private sector estimates

9.7. In the case of mechanised road transport comprising passenger transport by tramways, and passenger and freight transport by buses and other motor vehicles, the measurement procedure requires data on number of workers and value added per worker. The estimates of value added per worker are based on a limited number of surveys undertaken in a few States. Thus, in the case of mechanised passenger/freight transport, value added per worker is arrived at by combining the annual survey results of private road transport undertakings in Kerala and Punjab. For private transport by other motor vehicles, the gross/net value added per worker for 1970-71 is arrived at by combining the survey results of taxis and autorickshaws in respect of Karnataka (1965-66)⁴⁰ and Maharashtra (1972-73)⁴¹. Since the surveys refer to periods other than 1970-71, value added per worker available from these surveys are brought forward/backward with the help of index number of consumer prices for urban non-manual employees in the respective States. For years subsequent to 1970-71, gross/net value added per worker for each category of transport is obtained using the same trend as for private road transport for which annual data are available from the current survey results of such undertakings in respect of Kerala and Punjab.

9.8. Estimates of workers in the private sector are obtained by deducting the corresponding working force in the public sector from the total. Total number of workers for 1970-71 are based on 1961 and 1971 population census results and these have been moved to other years with the help of changes in the (i) number of buses and tramways for passenger transport by such vehicles, (ii) number of trucks for freight transport, and (iii) number of other motor vehicles (taxis, autorickshaws and other motor vehicles) for passenger and freight transport by such vehicles. Data on number of transport vehicles for each

category are available from the "Motor Transport Statistics", released annually by Ministry of Transport and Shipping.

9.9. In this case of non-mechanised road transport comprising of (i) hackney carriages, bullock-carts, ekkas, tongas etc., (ii) transport by animals like horses, elephants, mules, camels etc., and (iii) transport by man (including rickshaw pullers, hand cart pullers, porters, coolies etc.), and inland water transport, the gross value added per worker⁴² are arrived by using the corresponding estimates of value added per worker for 1959-60, available from the NSS Report No. 105, *Tables with Notes on Household Non-mechanised Transport and Utilisation of Working Animals*, 15th Round: 1959-60 (NSSO, 1966). These estimates are brought forward with the help of index numbers of wages of rural skilled workers for rural areas and of consumer prices of urban non-manual employees for urban areas to obtain the corresponding estimates for 1970-71. Since the NSS results give no separate estimate of consumption of fixed capital, such expenditures are determined from the value of transport equipment (given in the said report) assuming their average life as 10 years. Number of workers in each of the above categories for 1970-71 are based on 1961 and 1971 population censuses.

9.10. Estimates of net value added and consumption of fixed capital for different types of non-mechanised road transport and inland water transport for subsequent years are first prepared at constant prices and then at current prices by superimposing the corresponding implicit price indicator of mechanised road transport. The indicator used for the constant price estimates is a combined index⁴³ of industrial and agricultural production for all above types of transport services [except transport by man (urban)]. For the category of transport by man (urban) the annual rate of change (at constant prices) for subsequent years is assumed to be the same as for mechanised road transport.

9.11. The annual accounts of private shipping companies engaged in ocean and coastal services are analysed for obtaining estimates of gross/net value added. However, to ensure complete coverage of such companies (non-response to the extent of 5 per cent) the results of the analysis are inflated on the basis of total gross registered tonnage (available from the *Merchant Marine Directory*⁴⁴, brought out by National Maritime Day Celebrations Committee) and tonnage covered.

⁴⁰ Comprehensive Traffic and Transportation Studies of Greater Bangalore, Central Road Research Institute, New Delhi,

⁴¹ Report of the Taxi Trade Enquiry Committee, 1973 Government of Maharashtra.

⁴² gva/nva resulting from both principal and secondary work divided by the number of principal workers.

⁴³ This index was obtained by combining the index number of industrial production (CSO) with the index number of agricultural production (DESAG) the weights being gdp from manufacturing (registered and unregistered) and from agriculture and allied activities.

⁴⁴ Three comprehensive issues have been brought out in 1967, 1971 and 1976. For the period 1972 to 1975 and 1977 onwards annual supplements are being brought out.

9.12. For other ocean and coastal services (sailing vessels) for the base year (1970-71) gross/net value added per worker is assumed to be the same as for public sector inland water transport. The number of workers in 1971 is obtained by deducting the number of workers in shipping companies/corporations (already covered under public and private sectors) from the estimated total number of workers in ocean and coastal transport. For subsequent years estimates of gross/net value added are first prepared at constant prices and then at current prices by superimposing the implicit price indicator of shipping companies/corporations. The estimates at 1970-71 prices are obtained by moving forward the base year estimates by the changes in the volume of cargo carried by sailing vessels (available from the *Merchant Marine Directory*).

9.13. For supporting services to water transport the base year estimates are prepared using the value added per worker in the corresponding services in public sector and the estimated number of workers. Number of workers in private sector services is obtained by deducting the number of workers in the public sector, (obtained from central and state budgets) from the total for the sub-sector. For subsequent years, these services are assumed to follow the same trend as the corresponding public sector services.

9.14. In the case of air transport in the private sector comprising non-scheduled operators and flying and gliding clubs, the estimates are prepared using data collected directly from such undertakings.

9.15. In the case of services incidental to transport comprising packing, crating, operations of travel agency etc., the estimates are prepared on the basis of annual data on commission paid to the booking agencies by shipping companies, air companies and railways. Such data for shipping and air companies are available in their annual reports whereas for railways, these are collected directly from the zonal railway offices.

Storage

9.16. Estimates are prepared separately for (i) warehousing, (ii) cold storage and (iii) storage (n.e.c.). For unorganised warehousing services, the estimates are prepared following the same method as for private sector supporting services to water transport.

9.17. In the case of cold storage the estimates for 1973-74 onwards are available from the reports of ASI (census and sample sector). The estimates for earlier years viz., 1970-71 to 1972-73 are prepared by carrying backward 1973-74 estimates with an indicator of value of output of fruits and vegetables and total catch of fish.

9.18. For storage not elsewhere classified, the gross/net value added per worker is assumed to be the average of relevant figures for

public sector warehousing corporations and cold storage. The annual number of workers is obtained using the annual compound growth rate observed in the corresponding category of workers between 1961 and 1971 population censuses.

Communication

9.19. The important sources of data for estimating value added from communication services are the budget documents of the central government⁴⁵, Union Government Finance Accounts and *Annual Report on Activities of the Indian Posts and Telegraphs Department*. The approach and method followed is the same as that for railways. The activities of postal life insurance and post office savings bank are however excluded from this sector and included in banking and insurance services respectively. Consumption of fixed capital is assumed to be the depreciation on historical costs and is obtained from the budget documents.

Estimates at constant prices

9.20. The estimates at constant prices are prepared separately for each category, generally by carrying forward the base year estimates by relevant indicators measuring the volume of activity (Appendix 9.2). For railways a combined indicator of passenger kilometers and net tonne-kilometers is constructed to carry forward the base year estimates. The two physical volumes of services are combined using passenger earnings and goods earnings in 1970-71 as weights. The ratio of net to gross value added at current prices is used for estimates at 1970-71 prices also.

Transport by Other Means

9.21. In the case of mechanised road transport, the indicator for carrying forward the base year figure is the estimated number of workers in each category which are assumed to change at the same rates as the corresponding numbers of vehicles. For non-mechanised road transport other than by man (urban) and inland water transport in private sector, a weighted volume index is constructed with indices of industrial (manufacturing) and agricultural production, (the weights being their contributions to gross domestic product in the base year). For non-mechanised road transport by man (urban), the overall trend of movement of mechanised road transport is used.

9.22. In the case of ocean and coastal water transport by shipping companies, the base year estimates of gross/net value added are moved forward with the volume index of traffic carried. This indicator is prepared using the data on number of passengers and volume of cargo carried, weighted respectively by per passenger earning and per tonne freight earning in 1970-71 and for ocean and coastal transport by sailing vessels, the indicator is the volume of cargo carried by sailing vessels. These data on volumes of

⁴⁵ Contain (i) Demands for grants for expenditure of the Central Government on the Indian Posts & Telegraphs Department, (ii) Detailed demands for grants of Ministry of Communications, and (iii) Explanatory memorandum on the budget of the Central Government.

water transport are available annually from the Merchant Marine Directory. In the case of supporting services to water transport, the base year estimates of gross/net value added are carried forward using the changes in the volume of traffic handled at major ports, also available from the same source. For inland water transport in the public sector, the corresponding estimates at current prices are deflated by the combined implicit price indicator of ocean and coastal water transport, and supporting services to water transport.

9.23. In the case of scheduled operators in air transport, the indicator is the volume of traffic carried and is prepared using data on passengers and cargo carried, weighted with per passenger earning and per tonne earnings in 1970-71. The source of information is the annual reports of Air India and Indian Airlines. For non-scheduled air operators, flying and gliding clubs and supporting services to air transport except International Airport Authority of India (IAAI), the estimates at current prices are deflated by the implicit price indicator of public administration and defence. For IAAI, the indicator is the implicit price indicator of scheduled operators in air transport.

9.24. For services incidental to transport the estimates of gross/net value added at current prices are deflated by the overall implicit price index of water and air transport.

Storage

9.25. The estimates of warehousing and storage n.e.c. at current prices are deflated by the change in warehousing charges per metric tonne of average capacity used in warehousing corporations. In the case of cold storage, the base year estimates are moved forward by the number of workers engaged.

Communication

9.26. Estimates of gross value added at 1970-71 prices are obtained by moving forward the base year (1970-71) figure with the help of combined weighted index of number of money orders, number of telegrams, number of telephones and number of other postal articles handled. The receipts from these services in the base year are used as weights. The ratio of net to gross value added at current prices is used to estimate net value added at constant prices.

Reliability, Objectivity and Current Status of Data

Railways

9.27. The estimates of value added from railways are based on upto-date information. However, current data on manufacturing establishments and workshops under the Ministry of Railways are not available. The estimates for these establishments are worked out on the basis of expenditure on maintenance of locomotives, carriages and wagon stocks obtained from the budgets. The norms of various components of value added in the expenditure on the above items are, therefore, revised as and when fresh data become available.

Transport by Other Means

9.28. For mechanised road transport the 1971 census data on number of workers adjusted to mid 1970-71 were projected to other years on the basis of data on number of buses, trucks, taxis and autorickshaws and other vehicles. Such data with full coverage are made available by the Ministry of Shipping and Transport with a time-lag of 1-2 years. Though the estimates in respect of public sector are based on the current data, similar data for private road transport undertakings are wanting. Survey results for a limited number of states (annual studies on private road transport undertakings for Kerala and Punjab and the results of studies conducted in Maharashtra (1972-73) and Karnataka (1965-66) for taxis, autorickshaws and other vehicles) are available. However, more extensive surveys are required to obtain reasonably representative all-India parameters.

9.29. For non-mechanised road transport the estimates are equally unsatisfactory being based on NSS survey results for 1959-60. The NSS results used for the purposes cover only the household enterprises, and non-household non-corporate enterprises are excluded from the purview of the survey. Also no data on consumption of fixed capital are collected by NSS. In the absence of any other data, the indicator of the combined index of industrial and agricultural production is assumed to reflect the annual trend in the activities of these categories of transport. It is thus obvious that the estimates call for much improvement. This is equally true for water transport as well as supporting services in the private sector and services incidental to transport. In the case of storage, no direct data are available or such services undertaken in small/unorganised enterprises.

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APPENDIX 9.1 : SOURCE MATERIALS USED FOR ESTIMATES AT CURRENT PRICES IN RESPECT OF TRANSPORT BY OTHER MEANS AND STORAGE

item	sources of data
(1)	(2)
<i>public sector</i>	
1. departmental	Central and State annual budget documents
2. non-departmental	annual reports of (i) State Road Transport Corporations (ii) Shipping Corporations and Companies (iii) Central Inland Water Transport Corporation (iv) Dredging Corporation of India (v) Scheduled Air Transport Operators (vi) International Air Transport Authority of India (vii) Port Trusts and (viii) Central and State Warehousing Corporations.
<i>private sector</i>	
3. mechanised road transport	
(a) buses & trucks	annual survey results of SSBs of Kerala and Punjab in respect of private road transport undertakings.
(b) other motor vehicles	(i) Report of the Taxi Enquiry Committee, Govt. of Maharashtra, 1973. (ii) <i>Comprehensive Traffic and Transportation Studies of Greater Bangalore</i> ; Central Road Research Institute, New Delhi, 1965-66.
4. non-mechanised road transport and unorganised inland water transport	NSS Report No. 105, <i>Tables with Notes on Household non-mechanised transport and Utilisation of Working Animals</i> , 15th round, 1959-60, (NSSO-1966)
5. ocean & coastal water transport	(i) annual reports of all private shipping companies. (ii) <i>Merchant Marine Directory</i> .
6. air transport	annual data received from non-scheduled operators and flying and gliding clubs
7. services incidental to transport	(i) annual reports of Shipping Corporation/companies and air transport scheduled operators. (ii) annual data received from zonal offices of Railways and travel booking agencies.
8. cold storage	<i>Annual Survey of Industries (Census & Sample sector)</i> .

APPENDIX 9.2 : LIST OF INDICATORS USED IN THE PREPARATION OF CONSTANT PRICE ESTIMATES IN RESPECT OF TRANSPORT BY OTHER MEANS & STORAGE

item	indicator
(1)	(2)
1. mechanised road transport :	
public sector	number of workers in public sector undertakings.
private sector	number of vehicles separately for each transport vehicle category, viz. bus freight carriers, other motor vehicles.
2. non-mechanised road transport other than man drawn (urban) and inland water transport in private sector.	weighted index of indices of industrial (mfg) and agricultural production.
3. transport by man drawn (urban)	overall trend of constant price estimates of mechanised road transport.
4. shipping companies and Corporations	volume of traffic carried
5. sailing vessels	volume of cargo carried.
6. supporting services to water transport	volume of traffic handled at major ports.
7. inland water transport in public sector	implicit price indicators of (i) ocean and coastal water transport. (ii) supporting services to water transport.
8. scheduled operators in air transport	volume of traffic carried.
9. non-scheduled operators flying and gliding clubs and supporting services to air transport except IAAI	implicit price indicators of public administration and defence.
10. IAAI	implicit price indicator of scheduled operators in air transport.
11. services incidental to transport	implicit price indicators of air and water transport.
12. warehousing and storage	changes in the warehousing charges per metric tonne of average capacity used
13. cold storage	number of workers.