

CHAPTER 22

CAPITAL STOCK AND CONSUMPTION OF FIXED CAPITAL

Introduction

22.1 Capital stock of a country is broadly referred to as that part of national wealth which is reproducible; it consists of all resources which contribute to the production of goods and services. The changing relationship between output and capital stock is an important aspect of the study of changes in productive efficiency in the various industries of a developing economy. Firm estimates of capital stock enhance the ability to associate capital formation with economic growth and to project future production possibilities, thereby leading to formulation of policies designed to achieve the desired economic objectives. These also provide a firm basis for estimating capital consumption needed to arrive at the estimates of various macro-economic aggregates on net basis.

22.2 The work on the estimates of capital stock has been in progress in the CSO for the past few years. Several studies have been undertaken in the NAD from time to time. The estimates of capital formation and CFC in respect of agriculture and ownership of dwellings relating to the households in NAS were being based on the estimates of fixed capital stock available from the results of the AIDIS of RBI. The estimates in respect of other industries and by type of institution were also attempted. However, till the release of the "New Series on National Accounts Statistics" in February, 1988, official estimates of capital stock by industry of use and by type of institution were not available. As early as 1981 the estimates of fixed capital stock by industry of use were prepared by NAD. These estimates were compiled by carrying forward the bench-mark estimates of net fixed capital stock (NFCS) at the end of the year 1949-50 of Mukherjee and Sastry (1959)* using the official estimates of net fixed capital formation (NFCF) as available in the NAS. These estimates were placed before the Advisory Committee on Compilation and Analysis of National Accounts (predecessor of Advisory Committee on National Accounts) in 1982. The Advisory Committee suggested further studies on capital stock to be carried out following the PIM by constructing life- table of various types of assets. Meanwhile, the Working Group on Savings, set up by the Government of India in May, 1981 under the Chairmanship of Prof. K.N. Raj, also examined critically the estimates of CFC used in NAS. The Working Group in its report submitted to the Government of India in 1982 recommended adoption of PIM to prepare the estimates of CFC for all the sectors. The relevant extract from the report is reproduced below:

"Another area in which improvements in estimation can and should be made relates to the provisions for depreciation (i.e. capital consumption). As described earlier, the existing practices and the underlying criteria vary from sector to sector. There are such extremes as no provision at all being made for depreciation in the case of physical assets used for government administration; in others, the provision made is on the basis of what income tax laws permit, as in the case of private sector companies, public corporations and companies, and even some departmental undertakings. It is important that the criteria and methods adopted are put on a more rational and uniform basis. In this regard, the methodology now adopted for estimating capital consumption in 'agriculture' appears in principle very logical and appropriate. Estimates of capital stock for each of the years are first built up on the basis of the perpetual inventory method with the help of independent data on the average age-structure of assets (separately for different types of assets), the rate of consumption of fixed capital is then arrived at as a proportion of the

* Please see references

value of stock in each case. This method needs to be extended to all other sectors. It would require building up of a comprehensive life-table of physical assets in each sector and sub-sector, based on detailed and painstaking analysis of the average life of each major group of physical assets. But such exercises alone can provide reasonably realistic estimates of the consumption of fixed capital and make the distinction drawn between gross and net capital formation more meaningful and dependable."

22.3 In pursuance of the recommendations of the Advisory Committee on National Accounts and of the Working Group on Savings, studies on the construction of life-table of assets and estimation of NFCS using PIM were initiated in the NAD. The NAD concentrated its efforts to prepare firm estimates of capital stock as on 31 March, 1981 so that the corresponding estimates of CFC based on these estimates could be prepared for use in the present series with base 1980-81. To begin with, the estimates of NFCS were attempted by type of institution, i.e., public sector, private corporate sector and household sector. These estimates were, however, deficient in as much as the private non-profit institutions were not covered for want of data. The NAD in its subsequent exercise constructed life-table of assets, separately for the public and private sectors and prepared the estimates of NFCS by industry of use. These estimates were discussed in various forums including the Advisory Committee on National Accounts, the Sub-Committee on Capital Stock set up by the latter for the purpose. The Sub-Committee preferred a combined life-table of assets for public and private sectors. The Sub-Committee also suggested that for irrigation dams, some definite life might be assumed whereas for roads and canals the current expenditure on repairs and maintenance provided in the budget documents could be assumed to be sufficient to keep these assets intact. Accordingly, a combined life-table of assets was attempted (as discussed in para 14) and the estimates of NFCS attempted afresh. These estimates were found to be only marginally different from the estimates attempted by the NAD earlier. Finally, the estimates of CFC based on the latest estimates of NFCS by industry of use were prepared and after these had been considered and found in order, were used in the the present series.

22.4 The estimates of stock of inventories also have been worked out in order to arrive at the estimates of total capital stock, which includes NFCS as well as stock of inventories. These estimates of capital stock as on 31 March, 1981 were published in a special publication 'Estimates of Capital Stock of Indian Economy', 1988. The conceptual details and the method of estimation used in working out the estimates are discussed in the following paragraphs.

Concepts of capital stock and consumption of fixed capital

22.5 The guidelines issued by the United Nations Statistical Office (UNSO) in 1977 defined the national wealth as 'total of various kinds of net tangible and intangible non-financial assets of residents, plus financial claims on non-residents less financial liabilities to non-residents'. Tangible assets have been further classified into (i) reproducible tangible assets (i.e., capital stock) comprising fixed assets and stocks (i.e., inventories) and (ii) non-reproducible tangible assets comprising land, timber tracts and forests, sub-soil assets & extraction sites, fisheries and historical monuments. The reproducible fixed tangible assets (i.e., fixed assets used for the production of goods & services) commonly known as fixed capital stock comprise assets in the form of residential buildings, non-residential buildings, dams, irrigation & flood control projects, other construction works, transport equipment, machinery and equipment, breeding stock, draught animals, dairy cattle and the like, and capital expenditure on land improvement, plantations, orchard developments and afforestation. The fixed assets include uncompleted construction assets also. The stocks include the inventories of goods producing industries,

trade, other industries and stocks of government services. These comprise stocks of finished and semi-finished goods and young livestock except breeding stock, dairy cattle and the like which form part of the fixed assets. It may, however, be clarified that the durable goods in the hands of households which are not used for further production of goods and services such as automobiles, refrigerators, washing machines, furniture, sewing machines, etc., as well as fixed assets mainly meant for defence purposes such as warships, fighter aircrafts, transport vehicles and war materials do not form part of the fixed capital stock as these are assumed to have been consumed as soon as they are purchased. However, the construction works undertaken by the households including buildings and capital expenditure on residential dwellings for defence personnel, border roads, ordnance factories etc., form part of the fixed capital stock. The details of various types of assets which constitute reproducible and non-reproducible tangible wealth are given in Appendix 22.1.

22.6 CFC as per SNA may be defined as that part of gross product which is required to replace fixed capital used up in the process of production during the period of account. This flow is based on the concept of economic life time of the individual assets. As such the estimates of CFC at replacement cost are necessary so as to derive the estimates of net product, net capital formation as well as net saving on a realistic basis.

22.7 Capital is an important input in the production process. The quantity and quality of capital influence not only the productivity of capital but also that of labour and total output. The guidelines issued by UNSO on the National and Sectoral Balance-sheet and Reconciliation Account of the System of National Accounts (UNSO, 1977) and on Tangible Assets (UNSO, 1979) prescribe the estimation of CFC at current replacement cost for use in national accounts estimates on the basis of the estimates of gross fixed capital stock (GFCS) at current market cost for each type of assets used in production process and their expected average life using the PIM. The PIM also provides the estimates of NFCS at current market prices. Several developed countries like Australia, Japan, United States of America and United Kingdom are already preparing the estimates of fixed capital stock and the CFC based thereon and are using the same in their national accounts aggregates.

22.8 According to the guidelines issued by the UNSO on Tangible Assets referred to in paragraph 22.7, the value of the stock of inventories can be estimated more easily by using book value data gathered from balance sheets of enterprises or records of establishments. This is because of the nature of inventories, which are generally turned over frequently. Most of the stock at the end of the year will, therefore, have been purchased fairly recently except in exceptional cases where the turnover frequencies happen to be low. As a result book values in such cases normally reflect relatively up-to-date prices. Therefore, the book value of stocks, according to the guidelines, can be used for the statistics of tangible assets without any adjustments.

Past studies

22.9 The estimates of net capital stock of the Indian economy had been prepared in the past by various scholars using the bench mark estimates of capital stock and carrying forward these estimates by official estimates of net capital formation prepared by the CSO. The first comprehensive estimates of capital stock were prepared for the year ending 1949-50 (Mukherjee and Sastry, 1959; Uma Datta and Vinod Prakash, 1960). Later, a series of estimates of capital stock at current and constant prices (Mukherjee, 1964) were prepared for the period 1950-51 to 1961-62. The detailed estimates of tangible wealth for the year 1960-61 were brought out by the RBI, 1963. These were subsequently revised

on the availability of fresh data (RBI, 1965). Later a paper on the subject by Gothoskar and Kirpa Shankar (1972) was also published in the RBI Bulletin. Uma Roy Choudhury and Pratap Narain & R.P.Katyal in their papers published in 1977 and 1980 respectively had also tried to present the estimates at the sectoral level and adjust some of the previous bench mark estimates to provide a comparative picture of the growth of the capital stock in various industrial sectors of the economy over the years. In the above mentioned studies the estimates were compiled by taking the bench mark estimates of capital stock and adjusting the same with the official estimates of capital formation, net of CFC, the latter having been arrived at primarily on the basis of allowance for depreciation as per Income Tax Rules. The limitations of official estimates of CFC used in the 1970-71 series are given in the 'National Accounts Statistics, Sources & Methods', April, 1980 and have been further elaborated by Katyal and Gupta (1984), while illustrating the use of PIM for estimation of fixed capital stock and CFC. Chaturvedi and Bagchi (1985) also used PIM for arriving at the industry-wise estimates of fixed capital stock and CFC and tried to show that the official estimates of CFC used in 1970-71 series were being grossly under-estimated. A number of other studies have also been conducted in India and abroad, the details of which have been cited in the references.

Perpetual inventory method

22.10 The common method of making the estimates of written-down replacement cost for fixed capital stock is the PIM. Figures of the written-down replacement value of the stock of fixed assets on a given date, say the beginning of a year, are based first of all on figures of GFCF, classified as much as possible according to type of fixed asset and year of acquisition, accumulated over a period to cover the acquisition of all fixed assets. The period should be long enough so that the fixed assets acquired before that period would have been retired, that is, their average useful life will have run out. Conceptually, the cost of acquisition of each class (same type and same year of acquisition) of fixed assets is adjusted to current gross replacement cost by an index of the average change in prices from the year of acquisition to the date in question; and allowance, valued at current replacement cost, for accumulated depreciation between the two dates is deducted in order to arrive at its written-down current replacement cost. In practice, the perpetual inventory may be built year-by-year at the constant prices of a given year. Net capital formation (GCF less the allowance for depreciation) during a year, adjusted to constant prices, for a class of fixed assets is added to the written-down value of its accumulated net capital formation as of the beginning of the given year at constant prices. The resulting constant price value of the net capital stock as of the beginning of the next year is converted to current replacement cost as of the later date. There are a number of approaches to writing off the value of fixed assets, such as straight line depreciation, declining balance and declining rate of depreciation, but in PIM, the straight line approach formation is recommended as this approach is most commonly used in business accounting. Once the perpetual inventory is built, it is to be maintained year-by-year by the same means as are outlined above. Alternatively, the PIM may be used on the basis of year-by-year extension of data gathered in national censuses or from fire insurance records on the written-down value of the stock of fixed assets as of a given date, classified to the extent possible according to type and age. The PIM can, of course, also be used to estimate the gross replacement value of fixed assets. Accumulated depreciation in that case need not be deducted for arriving at the initial estimates of the gross replacement cost of the capital stock, and the value at constant prices of GFCF rather than NCF is added year-by-year.

22.11 The UNSO document (1977) acknowledges that gathering and compilation of appropriate price index numbers on capital goods for purposes of the PIM raises difficult conceptual and practical problems. Since each construction project and each piece of

highly fabricated heavy machinery and equipment is produced on contract and usually consists of unique features, the compilation of comparable series of price indices must be based on pricing representative model of proxies. Price series on the models may be based on direct estimates of producers, on the combination of comparable prices of components or on regressions of the transaction values (costs) of completed projects on their strategic characteristics. Even in the pricing of less complex capital goods, as proxies or in their own right, serious problems of inadequacies in accounting for quality changes are encountered. The replacement cost arrived at from these price series can be taken as only approximations to market values. In addition to the complications and deficiencies mentioned above, many of the price series gathered on capital goods give too little attention to the valuations of purchasers and, therefore, do not reflect the forces of demand which, together with those of supply, determine the market prices.

22.12 The various steps involved in PIM are as follows :

- i. Assumptions are made about the average length of life of each class of assets separately distinguished;
- ii. GFCF is then estimated for each class of assets for 'L' years prior to 'Y', where 'L' is the average life of an asset and 'Y' is the year for which capital consumption and gross stock are to be estimated;
- iii. Appropriate price indices are to be identified and applied to the estimates of GFCF to convert them to constant prices;
- iv. The estimates of GFCF at constant prices are then aggregated for 'L' years to obtain the estimates of GFCS at constant prices at the end of the year;
- v. The GFCS of an asset is then divided by 'L' to obtain the estimate of capital consumption at constant prices;
- vi. The price indices are used to convert the estimates of capital consumption to current prices or to another price base;
- vii. The estimates of NFCS (i.e. GFCS for the year 'Y' minus accrued capital consumption during 'L' years) for the year 'Y' are first calculated at constant prices and then converted to current prices using appropriate price indicators; and
- viii. Having arrived at the capital stock at the end of the year 'Y', it is maintained year-by-year by the same procedure as outlined above.

22.13 The above steps obviously involve collection, compilation and categorisation of considerable amount of data on various types of assets and their prices for estimation of fixed capital formation and CFC separately for each class of assets and working out the same at constant prices under certain assumptions about their average life.

Assumed life of assets

22.14 As mentioned earlier, PIM necessitates the availability of reliable estimates of average age of various types of fixed assets in different industries. However, no life table of fixed assets is currently available in India. A paper presented at a seminar organised by United Nations Industrial Development Organisation (UNIDO) at Prague in 1970 provides information with regard to age of assets in different industries for developing countries.

Katyāl and Gupta (1984) presented a table giving average life for 32 types of assets. Chaturvedi and Bagchi (1984) presented assumed average life of construction and machinery assets in each industry of the economy. Detailed discussions were held by CSO with the concerned agencies like Directorate General of Technical Development; Ministry of Industry; Railway Board; Bureau of Industrial Costs & Prices; National Productivity Council; Delhi Electric Supply Undertaking; Departments of Posts & Tele-communications; Central Road Research Institute; Central Water Commission; Ministry of Shipping & Transport and Indian Roads Congress and the requisite information on average age of various assets obtained. Data on average life of machine tools in the reports of Censuses of Machine Tools (1968 & 1986) conducted by Central Machine Tools Institute, Bangalore, were also examined. The information on average life in certain industries is also available from Koti and Somayajulu (1971). The average life of assets on the basis of depreciation provision under Income-Tax Rules as well as in the Companies (Amendment) Act, 1988 have also been considered. On the basis of the above materials as well as discussions held with concerned experts, the average life for each type of assets was attempted and the same is given in Table 22.1. In the case of roads and canals, it was felt that the current expenditure on repairs and maintenance are sufficient to maintain these assets for a long time. As such no depreciation need be provided for such assets.

Procedure of estimation

22.15 The estimates of net capital stock separately for NFCS and stock of inventories as on 31 March, 1981 and the CFC during the year 1980-81 have been prepared by type of institution and by industry of use for each type of asset. For estimation of CFC, the straight line method as recommended in the UNSO guidelines (1977) has been utilised. The PIM as outlined in the UNSO guidelines does not provide for adjustment of capital losses in the estimates of capital formation. It recommends that the capital losses may be adjusted in the Reconciliation Account. However, in principle, there does not seem to be any justification not to adjust the capital losses that have taken place during a year in the estimates of capital stock. At the same time, it is difficult to make these adjustments in the Indian conditions as the necessary data on capital losses are rather scanty (Jagdish Kumar et al, 1986). It is for this reason that no adjustment for capital losses has been possible here.

22.16 As in the NAS, the economy is divided into three broad institutional sectors i.e., public sector; private corporate sector; and household sector (residual), as also into various industry groups i.e. agriculture; forestry & logging; fishing; mining & quarrying; manufacturing; construction; electricity, gas and water supply; transport, storage & communication; trade, hotels & restaurants; banking & insurance; real estate, ownership of dwellings & business services; public administration & defence; and other services. The annual estimates of GCF at constant (1970-71) prices are available in the regular publications of NAS. Since these estimates are not prepared for each type of assets as required by PIM, the estimates at current prices have been made use of. These have been converted to constant (1980-81) prices using appropriate price indices as described in the subsequent paragraphs. The procedure of estimation of NFCS, CFC and stock of inventories for each of the institutional sectors/sub-sectors and for industries within these institutional sectors is described in the following paragraphs.

Net fixed capital stock

Public Sector

22.17 Public sector comprises Administrative Departments, Departmental Enterprises (DEs) and non-departmental commercial undertakings (NDCUs). For each of the sub-sectors industry-wise estimates of NFCS and CFC have been attempted separately.

Administrative Departments

22.18 Data on capital outlays in administrative departments upto the year ended 1949-50 at book value have been collected from the Report of Combined Finance & Revenue Accounts (CFRA) of the Central and State governments, 1949-50. The book value of these assets upto the year ended 1949-50 has been converted at replacement cost using the revaluation ratio of 2.8 worked out from the data on book value and replacement cost in respect of railways and irrigation assets discussed under the departmental enterprises (Para 22.22). Annual data on GFCF by type of assets and industry of use are available in the NAS and the CSO (1983) publication dealing with transactions of public sector. These estimates have been further disaggregated into those relating to buildings, roads & bridges, other construction works, transport equipments, machinery & equipments and net purchase of second hand physical assets (NPSA). From the year 1980-81 onwards NPSA has been appropriately assigned in NAS to the respective categories on the basis of details available in budget documents and reports of the undertakings. For the years prior to 1980-81, NPSA has been distributed into above categories except roads & bridges and other construction works on pro-rata basis. The capital outlays upto the year 1949-50 at replacement cost and the estimates of GFCF at industry level at current prices have been converted into constant (1980-81) prices for all industries and for all types of assets by applying the undermentioned relevant price indices.

Type of asset	Index used
Buildings	Index number of cost of construction of urban buildings
Other construction	Index number of cost of construction of other construction works (accounted)
Roads & bridges	Index number of cost of construction of roads & bridges
Transport equipment	Wholesale price index for transport equipment
Machinery & equipment	Wholesale price index for machinery & machine tools

22.19 The estimates of NFCS and CFC for the year 1980-81 have been attempted separately for the assets created before and after 1949-50. These have been aggregated to arrive at the total NFCS and CFC for the year 1980-81.

22.20 The assets prior to 1949-50 accumulated over the past years are assumed to have outlived half of their life. As such for applying PIM half of the assumed life has been taken for such assets and annual CFC has been kept constant till these assets have retired i.e., without decreasing GFCF until it depreciates in full. Further, in this case only construction assets have been taken into account as the assets in respect of plant and machinery created prior to 1949-50 would have retired by 1980-81.

Please see Appendix 22.2 for details

22.21 For the assets created from 1950-51 onwards the estimates of GFCF at constant (1980-81) prices have been accumulated to estimate GFCS at the end of each year. The NFCS and CFC have been estimated by PIM taking average ages as given in Table 22.1.

Departmental Enterprises

22.22 For railways and irrigation projects data on capital outlays were compiled from the year 1853 and 1876 onwards from the Ministry of Railways and Report of the CFRA respectively. For other industries book value of assets for the year ended 1949-50 have been compiled from the report of the CFRA for want of details for earlier years. An examination of the balance sheet of the Railways followed by discussion with the Railway authorities revealed that the total capital outlays upto the end of a particular year were net of capital expenditure on renewals and replacement by like items as these are not treated as new capital outlays by the Railways. However, these outlays include capital outlays of land and stocks (inventories) as well. Besides, the series of estimates of capital outlays for the Railways and also for irrigation are not comparable over all the years, as in 1937 due to Burma being separated from India and in 1947 due to creation of Pakistan assets were transferred to these countries. These assets have been suitably readjusted for the previous years by applying a proportion of the assets which remained in India to the total assets as existing before 1937-38 and 1947-48 respectively. From this derived series of total capital outlays at historical prices which is net of expenditure on renewal and replacements, the series of net capital formation at book value has been obtained on the assumption that expenditure on renewals and replacements compensates for the allowance for depreciation. The same has been converted into 1949-50 prices with the help of general index of wholesale prices for all commodities available since 1861 from DGCIS and Office of the EA with different base years by suitably linking the series. It may be pointed out that the commodity-wise indices for machinery and inputs of items of construction, i.e. steel, cement, etc., prior to 1949-50 are not available. Moreover, since most of the assets prior to 1950 would have retired by 1981, the use of general index does not vitiate the estimates of fixed capital stock and CFC after 1981. Incidentally, it may be added that in spite of best efforts it has not been possible to obtain corresponding representative indices from the Central Statistical Office of the United Kingdom. The estimates of net capital formation at 1949-50 prices so arrived at have been accumulated over the years to obtain the total net capital stock at the end of the year 1949-50 at current prices. The net capital stock at the end of 1949-50 so arrived at is inclusive of land value and inventories as mentioned above. In order to derive the NFCS, the value of land and inventories has been excluded with the help of detailed break up available in Railway budget explanatory memorandum since late fifties. This estimate of total NFCS is disaggregated into buildings, roads and bridges, track, rolling stock and plant & machinery in the ratio of the break up of the total fixed capital of Railways in the late fifties to arrive at the total fixed capital at the end of 1949-50 for each type of assets in the Railway. It has been assumed that the assets existing at the end of the year 1949-50 have completed half of their average life.

22.23 The estimates of capital outlays prior to 1949-50 are available for all departmental enterprises and separately only for railways and irrigation (which accounted for majority of the total fixed assets in departmental enterprises in 1950). For the departmental enterprises other than railways & irrigation, industry-wise capital outlays are not available and as such the procedure followed above cannot be used to revalue the assets of these departmental enterprises. The book values of assets prior to 1949-50 for these industries have been converted to replacement cost using the combined replacement ratio of 2.8 obtained for railways and irrigation.

22.24 These assets at the end of 1949-50 (at current prices) have been converted to 1980-81 prices with the help of relevant price indices. The data on GFCF have been compiled from the budget documents and CSO (1983) publication dealing with transactions of public sector. The estimates of GFCF at 1980-81 prices have been prepared using the price indices as for the administrative departments except for the railways permanent way and rolling stock. For these, the 'Index of cost of construction of railway permanent way' and 'Wholesale price index for rolling stock' have respectively been used.

22.25 The PIM was applied as in the case of administrative departments separately for the stock of assets existing at the end of 1949-50 and created after 1949-50 for each type of assets under each industry separately taking ages of assets as given in Table 22.1.

Non-Departmental Commercial Undertakings

22.26 The data on stock of fixed assets at the end of the year 1949-50 for NDCUs in case of mining and transport undertakings have been collected from the report of Taxation Enquiry Commission (Ministry of Finance, 1958). The book value of these assets is only about Rs. 1 crore. As these assets may be of recent origin, revaluation has not been done. For manufacturing, electricity and other industries, these are assumed to be negligible as most of the undertakings were established after 1950-51. The data on GFCF for the period 1948-49 to 1959-60 in case of manufacturing industry and at the aggregate level have been taken from a paper by Jagdish Kumar et al (1963). Use has also been made of 'Transactions of Public Sector' (CSO, 1983) and the various issues of NAS. The estimates of GFCF at current prices have been compiled by industries with break up into buildings, other construction works, capital work in progress (CWP), expenditure during construction (EDC), transport equipment, plant & machinery and NPSA. For adjustment of CWP and EDC, the reports of the NDCUs have been analysed in detail with a view to know the type of these entities. On the basis of the analysis, the EDC has been distributed appropriately.

22.27 The estimates of GFCF at current prices have been converted into constant (1980-81) prices with the help of relevant price indices as in the case of administrative departments. The estimates of NFCS and CFC have been prepared by PIM using the age of assets as given in Table 22.1.

Private Corporate Sector

22.28 This sector comprises public limited companies and private limited companies i.e., companies in the private sector set up under the Companies Act and credit and non-credit co-operative societies. The RBI have published the industry-wise all-India data on fixed capital stock based on sample studies for the non-government, non-financial public limited companies for the year ended 1949-50. In regard to private limited companies, data on fixed assets based on RBI sample studies are available for 1949-50 in the report of Taxation Enquiry Commission, 1958. These estimates have been blown up with the help of data on PUC for sample companies to all companies at the industry level. The estimates for the banks and other financial institutions are adopted from the paper by Mukherjee & Sastry (1959). The estimates of GFCF in private corporate sector for 1950-51 onwards at the aggregate level are published in various issues of NAS separately for joint stock companies and co-operative societies and these estimates are built up at the industry level. The estimates of fixed assets at the end of 1949-50 for co-operative societies are not available. These are, however, expected to be negligible as the co-operative institutions are of recent origin.

22.29 As the stock of fixed assets as on 31 March, 1950 is available at book value, it is to be revalued at 1949-50 prices and later converted to 1980-81 prices. The revaluation ratio as used in public sector could not be used in private corporate sector as the proportion of the construction assets is much larger in case of railways and irrigation compared to private corporate units. Also the various industries in private corporate sector, set up at different point of time, may not be as old as establishment of railways and irrigation system in India. In view of this an exercise was attempted by carrying backward the estimates of fixed capital stock at book value for 1949-50 as far back as 1900-01 on the basis of index of industrial production as given in "The Note on the Long Term Growth of National Income in India, 1900-01 to 1952-53" (Mukherjee, K. 1960) and index number of wholesale prices. As already explained, the indices of wholesale prices of capital goods are, however, not available prior to 1950. The series of fixed capital formation so derived at 1949-50 prices has been accumulated over the years to derive the estimates of fixed capital stock as on 31 March, 1950 at replacement cost. The ratio of this estimate at replacement value to that of book value works out to 2.4 which when compared with the ratio of 2.8 for railways and irrigation seems to be reasonable. As the replacement ratios are expected to vary over the industries, the overall ratio of 2.4 was adjusted suitably at the industry level. This adjustment has been done on the basis of data on proportion of value of depreciated stock to total value of fixed assets as available in the RBI study on Finances of Joint Stock Companies (1948) and the proportion of construction assets to total assets in various industries.

22.30 The estimates of Capital Stock as on 31 March, 1950 & GFCF from 1950-51 onwards at current prices have been converted to 1980-81 prices with the help of price indices given in Table 22.2.

22.31 The PIM has been applied to estimate NFCS, CFC for all industries using the age of assets given in Table 22.1.

Household Sector

22.32 This sector comprises household and non-household unincorporated enterprises and non-profit institutions. The estimates of NFCS of household enterprises in respect of agriculture(excluding land improvement and livestock) and ownership of dwellings have been prepared as on 31 March, 1981 on the basis of data of net capital stock available from the results of AIDIS, 1981-82 as contained in NSSO report No. 318 and some data specially got tabulated. It may, however, be mentioned that separate data on capital expenditure on land and plots are not available as the same are included in the expenditure on fixed assets. The expenditure on land & plots has been excluded using the ratio as obtained from the detailed analysis of capital expenditure available from AIDIS, 1971-72 as similar data from AIDIS, 1981-82, are not yet available. Moreover, AIDIS, 1981-82 does not give separately values of improvement of land and irrigation works, but the same are merged with the value of land. Such expenditure during the year is, however, treated as part of capital formation. The estimates of NFCS of this category have, therefore, been prepared using estimates of gross capital expenditure at current prices on the basis of data available from All India Rural Credit Survey (AIRCS), 1951-52; All India Rural Debt and Investment Survey (AIRDIS), 1961-62; AIDIS, 1971-72 and 1981-82. The estimates of capital formation at current prices have been converted to constant prices using index of other construction works.

22.33 In the case of livestock, AIDIS provide data on capital stock inclusive of poultry and young livestock. However, poultry and young livestock form part of inventories. The

estimates of net capital stock available from AIDIS have been divided into fixed assets and inventories on the basis of state-wise analysis of ILC data and the average price per head of various types of livestock available from the state governments. Thus, the estimates as on 31 March, 1981 are based on AIDIS data for 1981-82.

22.34 The AIDIS, 1981-82 does not provide the estimates of gross capital stock. As such, it is not possible to attempt the estimates of CFC in respect of agriculture and ownership of dwellings on the basis of data available from AIDIS, 1981-82. However, as mentioned, the estimates of GFCF are available in NAS in respect of these industries. In the case of agriculture, the stock of fixed assets at the end of 1949-50 have not been taken into account as the same would have retired by 1980-81. In the case of ownership of dwellings, the estimates of NFCS for rural and urban residential buildings as given in the paper by Mukherjee & Sastry (1959) have been made use of. The estimates of CFC for these two categories have been prepared using PIM.

22.35 For the remaining industries in the household sector, AIDIS does not provide data at the industry level. Furthermore, AIDIS does not cover non-profit institutions. In order to prepare the estimates of NFCS for these industries, the estimates at the end of the year 1949-50 as given in the paper by Mukherjee and Sastry (1959) have been taken as the base. For the subsequent years, data on GFCF at current prices as available from the NAS have been utilised. The estimates of GFCF at current prices have been converted to constant prices using the price indices in respect of construction and machinery as in the case of private corporate sector. The estimates of NFCS and CFC for the year 1980-81 have been prepared using the age of assets as given in Table 22.1.

Stock of inventories

22.36 In order to estimate the stock of inventories as on 31 March, 1981 an attempt has been made to compile such estimates by type of institution, i.e., public sector, private corporate sector and household sector within each industry group using available source material. The method of estimation is described in the following paragraphs.

Public Sector

22.37 The estimates of inventories within the public sector have been compiled separately for administrative departments, departmental enterprises and non-departmental enterprises. In the case of administrative departments of the Government, the stocks held are in the nature of (i) policy stocks like food, fertilizers etc., and (ii) work stores under the civil works departments and consist of cement, bricks, steel, etc. The policy stocks are given in the form of purchases and sales during the year and the net purchases during the year as obtained from the economic & purpose classification of the budget documents are classified as change in stock. However, the CFRA give net purchases as on 31 March of each year. Net purchases as on 31 March, 1981 have, therefore, been taken from the CFRA. In the case of work stores, suspense accounts are maintained by the Government under the appropriate heads of account. Addition to the stocks is shown against the suspense appearing in the expenditure side, while the withdrawals out of these stocks during the year are shown against the 'receipts and recoveries on capital account'. The purchases during the year minus withdrawals are treated as change in stocks. In the case of works stores, however, it has been noticed that the change in stocks during the year in most of the years is negative. The corresponding figures as on 31 March available from CFRA are also substantially negative year after year. Discussions were held with the officers of the Ministry of Finance as well as CPWD to find out the possible reasons for the negative stocks as on a particular date as well as during the year.

Both the Ministry of Finance and CPWD clarified that the procurement of stock of inventories are shown in the suspense account under the expenditure account and withdrawals are shown under recoveries. As such, the procedure followed by the NAD so far was in order. However they were not able to assign any reason why the stock of inventories on a particular date could be negative and that also year after year. The issue was, therefore, further discussed with other knowledgeable people in this field. They felt that normally stock of stores and raw materials at least for one month at any point of time are scrupulously maintained. For instance, in the case of a thermal power station, the minimum stock of coal required for one month is generally maintained.

22.38 Considering, therefore, the abnormal results obtained in the case of change in stocks for work stores out of the economic and purpose classification of government budgets and also the discussions with the concerned authorities, it was not possible to arrive at the stocks as on a particular date on the basis of suspense account relating to work stores as contained in the budget documents. However, it is a common practice to maintain the stock of commodities to last for about a month. On this supposition the stock of work stores at the end of the year in the administrative departments can be estimated by taking 1/10th of the capital formation during that year and balance the capital finance account of administrative departments by making suitable adjustments in the 'other liabilities'. Based on this proposition, the stocks have been reworked and used.

22.39 In the case of departmental enterprises like railways, communication, etc., the stock of inventories as on 31 March, 1981 are available from their annual reports as well as from budget documents. In the case of non-departmental enterprises data on stock of inventories as on date are available from their balance sheets and for 31 March, 1981 these have been compiled for all the undertakings from their balance sheets, separately for each industry group.

Private Corporate Sector

22.40 The private corporate sector comprises joint stock companies and co-operative societies. In the case of joint stock companies, RBI's sample studies of public and private limited companies carried out annually provide the industry-wise estimates of total stock of inventories as on 31 March of each year and for 31 March, 1981, the same have been used. In the case of co-operative societies, data on stock of inventories are available from the NABARD publication 'Co-operative Movement in India'. For 31 March, 1981 the estimates of stock as obtained from this publication have been adopted.

Household sector

22.41 **Agriculture:** The household inventories in agriculture pertain to livestock only. Inventories in case of cash crops, as mentioned in the Brochure on New Series of NAS brought out by CSO in February, 1988 have been assumed to be negligible. The inventories in case of livestock have been obtained after a detailed exercise using the estimates of number of cattle of different categories and the corresponding prices in different states. Inventories in respect of foodgrains with producers and consumers, if any, are covered under the trade sector.

22.42 **Manufacturing (Registered):** The ASI covers total inventories of public sector, private corporate sector and households. The book value of these inventories have been adjusted for the inventories of defence factories not covered in ASI on the basis of special returns received from the Ministry of Defence and the same have been adopted.

22.43 Manufacturing (Unregistered): The inventories in unregistered manufacturing are being estimated as 36 per cent of the GVA in connection with the annual estimates of NAS on the basis of the data available from (a) Report No. 280/6, Table with Notes on Survey of Self Employed Households in Non-Agricultural Enterprises-Detailed results for All India, 29th round (1974-75) (NSSO, 1978), (b) Survey of Small Scale Industries in the Unorganised Sector in Urban Areas, 1971-72, mimeograph (CSO, 1975) and (c) Special Tabulation of Census of Small Scale Industries undertaken by Development Commissioner, Small Scale Industries (DCSSI) in 1977.

22.44 Transport by other means: For want of any data, the ratio of GVA and inventories observed in road and water transport in the public sector has been applied to obtain the inventories of the household sector.

22.45 Trade: As mentioned above, the estimates of stock of foodgrains with the private traders, producers and consumers have been worked out on the basis of the method followed by Dandekar (1986) in his recent work "Agriculture, Employment and Poverty" - a paper presented in the conference organised by the Centre for Asian Development Studies, Boston University, October, 1986. According to this method, consumption of foodgrains has been subtracted from the net availability with the public to arrive at the estimates of stocks. The quantitative stock of cereals and pulses as on 31 March, 1981 have been evaluated with the help of corresponding prices. The inventories of commodities other than foodgrains in household trade have been worked out on the basis of bank advances to traders against the stock held by them. The banks normally keep a margin of about 45 per cent while making the advances. For example, against a stock of Rs. 1,00,000, the bank normally will advance Rs.55,000. This bank margin has accordingly been taken into account while estimating the stocks with the traders.

Estimates of capital stock

22.46 The estimates of NFCS, inventories and net capital stock by type of institution and by industry of use at the overall level and separately for the public sector at current prices as on 31 March, 1981 are presented in Tables 22.3 & 22.4 respectively. The corresponding estimates of CFC at current prices, along with the corresponding estimates as per the 1970-71 series at current prices are presented in Tables 22.5 & 22.6. It may be seen from Table 22.5 that the CFC as per PIM and used in the present series is significantly higher in the case of public sector and only somewhat higher in the case of private sector. Within the public sector, CFC has been provided for administrative departments (public administration & defence) beginning with NAS, 1988, whereas upto NAS, 1987 no such provision was made. This accounts for about 16 per cent of the total estimates of CFC in the public sector. In the case of departmental enterprises, CFC based on PIM is about 4 times that of the NAS, 1987 estimates whereas in the case of NDCUs it is 65 per cent more than that of NAS, 1987 estimates. At the industry level (Table 22.6), CFC as per PIM is generally higher than that presented in NAS 1987, except in the case of trade; hotels & restaurants; and real estate, ownership of dwellings & business services where it is somewhat lower. The major increase in CFC at the industry level is accounted for by agriculture; manufacturing; electricity, gas & water supply; transport; and public administration & defence. It may be seen from the same table that bulk of the increase in these industries is in the public sector. This indicates that the public sector enterprises have not been making sufficient provision for depreciation in their annual accounts. For example, the railways, which is the major departmental enterprise had not been making adequate provision for depreciation and as such had not been maintaining their assets properly. This was adversely commented upon by the Railway Reforms Committee in its report on Railway Reserve Funds (1982). Thereafter, the railways have stepped up their

provision for depreciation as well as withdrawals from Depreciation Reserve Fund for renewals and replacements.

22.47 The overall fixed capital output ratio and capital output ratio for 1981-82 with respect to net domestic product (NDP) work out to 2.5 and 2.9 respectively. The corresponding ratios at the industry level are presented in Table 22.7. As may be seen from this table the ratios for electricity, gas and water supply; railways and ownership of dwellings are very high. For other sectors these vary from 0.3 in the case of forestry and banking & insurance to 5.9 for public administration & defence. In the case of public administration & defence, excluding roads and bridges used by all the industries, the fixed capital output ratio works out to 2.6 and capital output ratio to 2.7.

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APPENDIX 22.1 : Classification of tangible assets according to type

1. Reproducible tangible assets

1.1 Fixed assets

1.1.1 Residential buildings

Buildings, completed and uncompleted, which consist entirely or primarily of dwellings. Included are permanent fixtures such as fixed stoves, central heating, air-conditioning, lighting, plumbing and water-supply facilities, and all other fixed equipment customarily installed in dwellings. Hotels, autocourts and similar buildings operated for purely transient occupancy are considered to be non-residential structures.

1.1.2 Non-residential buildings

Buildings and structures, completed and uncompleted, which are entirely, or primarily, for industrial or commercial use. Examples of non-residential buildings are factories, warehouses, office buildings, stores, restaurants, hotels, garages, farm buildings such as stables and barns, and buildings for religious, educational, recreational and similar purposes. Also included are fixtures, facilities and equipment which are integral and unmovable parts of the structures.

1.1.3 Other construction works

Non-military works, completed and uncompleted, such as the permanent ways of railroads, roads, streets, sewers, bridges, viaducts, subways and tunnels, harbours, piers and other harbour facilities, car parking facilities, airports, pipelines, canals and waterways, water-power projects, dams, dikes and irrigation and flood control projects, aqueducts and sanitation projects, athletic fields, electricity transmission lines, gas mains and pipes, telephone and telegraph lines, etc. Includes the cost of laying out the necessary streets and sewers, but excludes groundwork within the building line, which should be included in residential or non-residential buildings, as the case may be.

1.1.4 Land improvement and plantation and orchard development

1.1.4.1 Land improvement

Outlays on all land reclamation and land clearance, irrespective of whether it represents an addition to total land availability or not; irrigation and flood control projects and dams and dikes which are part of these projects; clearance and afforestation of timber tracts and forests; and the transfer costs of transactions in land, farms, mineral deposits and concessions, timber tracts and forests, fishing grounds and concessions and similar natural resources.

1.1.4.2 Plantation, orchard and vineyard development

Expenditure on planting and cultivating, until they yield crops, of orchards, rubber plantations and new holdings of fruit-bearing and sap-bearing plants which take more than a year to become productive.

1.1.5 Transport equipment

Source : United Nations Guidelines on Tangible Assets, Series M No. 68, New York, 1979

Completed ships, aircraft, railway and tramway rolling stock, tractors for road haulage, trucks, moving vans and the like, motor vehicles, carts and wagons acquired by industries, government services for civilian use and private non-profit services. Transport equipment acquired for military purposes is excluded.

1.1.6 Machinery and equipment

1.1.6. Agricultural machinery and equipment

Agricultural machinery and equipment such as harvesters, threshers, ploughs, harrows and other cultivators, and tractors other than for road haulage.

1.1.6.2 Others

Durable goods not elsewhere classified to the fixed assets of resident producers. Included are power generating machinery; office machinery, equipment, furniture and furnishings; art objects, metal working machinery; mining, construction and other industrial machinery; cranes and fork-lift equipment; durable containers; equipment and instruments used by professional men; and equipment, furnishings and furniture for use by hotels, boarding houses, restaurants, hospitals, research institutions, schools and other services. Items of small value, such as hand tools, office desk equipment and furnishings, may be excluded on practical grounds if the customary accounting procedure is to treat them as current expense.

1.1.7 Breeding stock, draught animals, dairy cattle and the like

Breeding stock, draught animals, dairy cattle, sheep, llamas etc., raised for wool clipping.

1.2 Stocks

1.2.1 Goods-producing industries

Agriculture, forestry and logging and fishing; mining, manufacturing, and electricity, gas and water supply and construction.

1.2.1.1 Materials and supplies

All materials, components, parts and supplies acquired for extracting, processing, fabricating, assembling, repairing, etc. commodities and for construction works; coal, oil and other fuels purchased for consumption; stocks of fertilizers, insecticides, seeds, feeds and similar goods of agricultural producers; greases and other lubricants; purchased non-durable containers, factory packaging, office and other supplies.

1.2.1.2 Work in progress

Goods that have been partially processed, fabricated or assembled by the goods-producing establishments but that are not usually sold, shipped or turned over to other establishments without further processing. Partially completed construction works are excluded.

1.2.1.3 Livestock, except breeding stock, dairy cattle and the like.

Livestock raised for slaughter; all chickens and other fowl; and other livestock except those enumerated in para 1.1.7 above.

1.2.1.4 Finished goods

Commodities of the goods-producing establishments, which are ready for sale or shipment by these units, including items which are usually sold by the units in the same form as and when purchased. Construction works are excluded.

1.2.2 Wholesale and retail trade

Goods acquired by units classified to wholesale and retail trade for sale or for use as fuels and supplies.

1.2.3 Other industries

Stocks of coal, oil and other fuel and of repairing and maintenance supplies of the transport, communication, financial and other industries n.e.c.; non-durable container, packaging, office and miscellaneous supplies; all other stocks of these industries.

1.2.4 Stocks of government services

Stocks of government services in strategic materials, grains and other commodities of special importance to the nation.

2. **Non-reproducible tangible assets**

2.1 Land

2.1.1 Land underlying buildings and works

Land on which are erected buildings and works included under items 1.1.1 through 1.1.3. Included are access roads to farms, yards of farm residential structures and the like. In the case of residential buildings it is necessary to impose a limit to the size of private gardens surrounding dwellings; if no limit is prescribed for local taxation purposes, any excess of land over 0.5 hectares should be included under item 2.1.3 below.

2.1.2 Cultivated land

Land on which agricultural or horticultural activity is carried on for commercial or subsistence purposes, including all plantations, orchards and vineyards. Land forming a part of a farming enterprise, but not access roads, farmyards, etc., which should be classified to item 2.1.1. Private gardens and plots not cultivated for subsistence or on a commercial basis should go under item 2.1.3, except that a limited area surrounding dwellings should be classified to item 2.1.1.

2.1.3 Others

Privately owned amenity land, parklands and pleasure grounds; private gardens and plots not cultivated for subsistence or commercial purposes, and the excess area above a certain limit of private gardens surrounding residential buildings.

2.2 Timber tracts and forests

All timber having a commercial value in forests, timber tracts, woodlands and copses and the underlying land.

2.3 Subsoil assets and extraction sites

2.3.1 Coal, oil and natural gas reserves and sites

Anthracite, bituminous and brown-coal deposits and shafts and open-cast mines; petroleum and natural gas reserves, wells and fields.

2.3.2 Metallic mineral reserves, mines and sites

Ferrous, non-ferrous and precious metal ore deposits, mines and other extraction sites.

2.3.3 Other non-metallic mineral reserves, mines and sites.

Stone quarries and clay and sand pits; chemical and fertilizer mineral deposits, mines and other extraction sites; salt deposits, mines and extraction sites; deposits, mines and other extraction sites in the case of quartz, gypsum, natural gem stones, asphalt and bitumen, peat and other non-metallic minerals other than coal and petroleum.

2.4 Fisheries

Stocks of fish and the associated works in the case of fishponds and farms, cultivated oyster and pearl beds, and other fisheries. Only commercially run fisheries in inland waters (rivers and lakes) and inshore when separated from the open sea by a barrier should be included.

2.5 Historical monuments

Buildings, statues and other structures of historical or major cultural interest which have been the subject of a transaction in the capital finance accounts.

APPENDIX 22.1: Indices used for deflation of estimates of capital formation, capital stock and consumption of fixed capital

I. Index of wholesale price:

The general index of wholesale prices with base 1873=100 is available from 1861 to 1939. This index was compiled by the Department of Commercial Intelligence and Statistics (DCI&S). The index covered only a few commodities and mainly catered to the food articles. The preparation of the index of wholesale prices was taken up by the office of the EA in 1942 and this series, with base 1939=100, assigned equal weights. The series was, however, revised with the same base by including as many as 78 commodities in order to have a complete picture of the price movements of all important commodities. This index had some items of machinery. The subsequent series with base 1952-53 also covered comprehensively agricultural commodities and the coverage of non-agricultural commodities became increasingly inadequate. This index was subsequently revised to base 1960-61 and the present series has got the base 1970-71. The latest series cover adequately the manufacturing products and provided reliable index at group and sub-group levels for various groups of items. Thus, prior to independence the representative index of wholesale prices of capital stock is not available and one has to have a recourse for conversion of the estimates of fixed capital formation from current to constant prices to all commodities index. After independence the group indices of plant and machinery, transport equipment, etc., are regularly available and the indices with various bases could be linked up suitably for deflation purposes. The indices of wholesale prices used for various items are given below.

Description of index	Sector/industry for which used as a deflator for capital formation and capital stock
(i) DGCIS general index of wholesale prices/ EA's index of wholesale prices from 1861 to 1949-50 and co-operatives with suitable link up	For all assets prior to 1949-50 in respect of public sector, private sector
(ii) EA's index of wholesale prices for machinery and machine tools	For plant and machinery
(iii) EA's index of wholesale prices for transport equipments	Rolling stock of railways and transport equipments

II Indices of cost of construction:

These indices are specially prepared regularly and used for the estimates prepared in NAS in respect of (i) urban residential buildings, (ii) rural residential buildings, (iii) other construction works (accounted), (iv) other construction works (unaccounted) and (v) general pucca construction by taking into account itemwise material inputs and labour in proportion of their value in the total cost of construction in respect of each category separately in base year as weights with base 1980-81=100. The weights allotted to different materials and labour inputs in preparation of these indices which have been decided in consultation with CPWD and other agencies are given in Table 22.8.

The indices of cost of construction used for various categories are as below:

i) Index of cost of urban buildings and urban residential buildings	All public sector and residential buildings ,private corporate sector
ii) Index of cost of rural residential buildings	Rural residential buildings and rural non-residential buildings
iii) Index of cost of other construction works (accounted)	Non-residential buildings and other construction, works and irrigation
iv) Index of cost of other construction works (unaccounted)	Construction in plantation and forestry
v) Index number of railways assets:	<p>a) Rolling Stock: This index is prepared by taking weights of value of wagons, coaches and engines. These weights are decided on the basis of proportion of value of these assets in railways. Prices of these items were available from DGS&D index of government purchases upto 1976-77. After that the same index has been moved with the help of the index of transport equipments.</p> <p>b) Permanent way material: This index has been prepared taking into account the prices of rails and fastenings and prices of railway sleepers as available from DGS&D upto 1976-77. After that this index has been moved with the help of price index of iron and steel.</p>
vi) Price index for fishing machinery:	This index is based on weighted wholesale price indices of timber ,diesel engine, nylon, terene & mixed cotton. The prices for timber are taken from the Bulletin of the National Buildings Organisation (NBO) and for diesel engine and nylon, terene and mixed cotton from Economic Adviser's wholesale price index.
vii)(a) Wholesale price index for non-electrical machinery	This index is available from Economic Adviser's Office. It has been used for the agriculture machinery produced in organised sector and construction industry in organised sector
vii)(b) The wholesale price index for tools and implements	It is available from the Office of the Economic Adviser. It has been used for machinery used in agriculture produced in unorganised sector.

III. Index of cost of construction of roads and bridges:

This index was prepared with the help of price indices for different materials, wage rates of labour and equipments used in construction of roads and bridges with respective weights in input structure as given in Table 22.8. These weights have been decided taking into account the requirement of road and bridge materials and technical and manual labour on the basis of the discussions held with the officers of Ministry of Transport and Central

Road Research Institute. The prices of these materials and wages of labour are taken from NBO Bulletin and other sources used in NAD for relevant prices.

IV. Implicit Price Deflators

As part of the capital formation the implicit indices of fixed capital formation (i.e. current price estimates/constant price estimates multiplied by 100) are worked out in respect of construction and machinery & equipment separately and are presented in the various issues of NAS. These indices are used for deflation of estimates for fixed capital formation and fixed capital stock in construction and machinery, respectively for the private sector. A similar implicit price index for livestock has been specially prepared for use in the household sector.

TABLE 22.1: Average age of fixed assets

Type of assets (1)	Age in years (2)
Construction	
1. Buildings (residential/non-residential)	
1.1 Pucca	80
1.2 Kutchra	20
2. Bridges	100
3. Irrigation works including dams, canals etc.	100
4. Improvement of land and irrigation works	30
5. Plantations	20
6. Railway track	55
7. Electricity transmission works	45
8. Other construction works	35
9. Aggregate construction (i.e. where break up of expenditure into buildings etc. is not available)	
9.1 Manufacturing (comprising buildings, workshops, sheds, etc.)	50
9.2 Others (comprising mainly of buildings both pucca & kutchra)	65
Plant & Machinery	
10. Agricultural machinery	9
11. Manufacturing machinery	20
12. Mining machinery	10
13. Construction machinery	10
14. Electricity generators & plants	25
15. Railway plant & machinery	20
16. Other plant & machinery	15
17. Furniture	20
Transport Equipment	
18. Railway coaches, wagons & engines	33
19. Ships, vessels, motor boats, trawlers etc.	15
20. Aero planes	10
21. Buses, trucks, jeeps, cars etc.	10
22. Tongas, rickshaws, carts etc.	8

TABLE 22.2: Price indices used for various types of assets

Industry	Type of asset	Index (Please see Appendix for details)
(1)	(2)	(3)
1. Agriculture	1.1 Non-residential buildings and Other construction works (improvement of land and irrigation works)	Index of cost of other construction works (accounted)
1.2 Agricultural plantations	Index of cost of construction of other construction works (unaccounted)	
1.3 Machinery & Equipment (produced in organised sector)	Wholesale price index for non-electrical machinery	
1.4 Machinery & equipment (produced in unorganised sector)	Wholesale price index for tools and implements	
2. Forestry	2.1 construction	Index of cost of construction of other construction works (unaccounted)
	2.2 machinery	Wholesale price index of tools & implements
3. Fishery	Machinery	Weighted index of wholesale price index in respect of timber, diesel oil, nylon, terene and mixed cotton
4. Construction	Machinery	Wholesale price index for non-electrical machinery
5. Residential dwellings	5.1 Rural residential buildings	Index of cost of construction of rural buildings
	5.2 Urban residential buildings	Index of cost of construction of urban buildings
6. Mechanised road transport	Machinery	Wholesale price index for transport equipment
7. Non-mechanised road transport	Machinery	Wholesale price index for non-electrical machinery
8. Water transport	Machinery	Wholesale price index for transport equipment
9. Other industries	Construction & machinery	Implicit price indices available in NAS

TABLE 22.3: Estimates of capital stock as on 31 march, 1981 by type of institution

(Rs.Crore)

Institution	Net fixed capital stock	Inventories	Net capital stock
(1)	(2)	(3)	(4)
1. Public sector	128607	15586	144193
1.1 Administrative departments	38974	416	39390
1.2 Departmental enterprises	47105	2890	49995
1.3 Non-departmental commercial undertakings	42528	12280	54808
2. Private sector	166815	24080	190895
2.1 Private corporate sector	23226	9877	33103
2.1.1 Joint stock companies	20558	8855	29413
2.1.2 Co-operatives	2668	1022	3690
2.2 Household sector	143589	14203	157792
3. Total	295422	39666	335088

TABLE 22.4: Estimates of capital stock as on 31 march, 1981 by industry of use

(Rs.Crore)

Industry	Public sector			Total		
	Net fixed capital stock	Inventories	Net capital stock	Net fixed capital stock	Inventories	Net capital stock
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Agriculture	22772	234	23006	62778	3750	66528
2. Forestry & logging	867	8	875	915	8	923
3. Fishing	3	-	3	558	-	558
4. Mining & quarrying	4984	987	5971	5766	1180	6946
5. Manufacturing	15160	9005	24165	46944	20916	67860
5.1 Registered	15160	9005	24165	33736	17512	51248
5.2 Unregistered	-	-	-	13208	3404	16612
6. Electricity, gas & water supply	23640	1151	24791	24422	1252	25674
7. Construction	461	239	700	2158	1104	3262
8. Trade, hotels & restaurants	655	2681	3336	7495	9658	17153
8.1 Trade	479	2675	3154	5295	9640	14935
8.2 Hotels & restaurants	176	6	182	2200	18	2218
9. Transport, storage & communication	22470	752	23222	27517	1214	28731
9.1 Railways	14836	348	15184	14836	348	15184
9.2 Transport by other means	4384	254	4638	9373	715	10088
9.3 Storage	378	2	380	436	3	439
9.4 Communication	2872	148	3020	2872	148	3020
10. Banking & insurance	799	14	813	1238	16	1254
11. Real estate, ownership of dwellings & business services	2528	-	2528	77938	17	77955
12. Public administration & defence	31352	416	31768	31352	416	31768
	*13969	*416	*14385	*13969	*416	*14385
13. Other services	2916	99	3015	6341	135	6476
14. Total	128607	15586	144193	295422	39666	335088

- Indicates nil

* Excluding roads and bridges

TABLE 22.5: Estimates of consumption of fixed capital during 1980-81 by type of institution

(Rs. Crore)

Institution	As per	
	PIM	1970-71 series
(1)	(2)	(3)
1. Public sector	4895	1978
1.1 Administrative departments	764	-
1.2 Departmental enterprises	1461	365
1.3 Non-departmental commercial undertakings	2670	1613
2. Private sector	7192	6046
2.1 Private corporate sector	1699	1418
2.1.1 Joint stock companies	1565	1332
2.1.2 Co-operatives	134	86
2.2 Household sector	5493	4628
3. Total	12087	8024*

* - Adjusted to exclude revaluation of assets, loss on sale/purchase of assets etc., in respect of commercial banks in the published figures.

TABLE 22.6: Estimates of consumption of fixed capital during 1980-81 by industry of use

(Rs. crore)

Industry	Public sector		Total	
	As per		As per	
	PIM	1970-71 series	PIM	1970-71 series
(1)	(2)	(3)	(4)	(5)
1. Agriculture	333	17	2410	1589
2. Forestry & logging	31	-	33	11
3. Fishing	-	-	115	64
4. Mining & quarrying	350	391	413	299
5. Manufacturing	1029	565	2946	1986
5.1 Registered	1029	565	2231	1706
5.2 Unregistered	-	-	715	280
6. Electricity, gas & water supply	1120	340	1158	345
7. Construction	70	27	343	287
8. Trade, hotels & restaurants	28	23	391	670
8.1 Trade	19		284	
8.2 Hotels & restaurants	9		107	
9. Transport, storage & communication	1252	581	2000	1084
9.1 Railways	565	206	565	206
9.2 Transport by other means	495	305	1242	808
9.3 Storage	7		8	
9.4 Communication	185	70	185	70
10. Banking & insurance	33	31	64	51*
11. Real estate, ownership of dwellings & business services	38	-	1463	1541
12. Public Administration & defence	487	-	487	-
13. Other services	124	3	264	97
14. Total	4895	1978	12087	8024*

- Indicates nil

* - Adjusted to exclude revaluation of assets, loss on sale/purchase of assets etc., in respect of commercial banks included in the published figures.

**TABLE 22.7: Capital output ratios with respect to net domestic product
1981-82**

Industry	Fixed capital output ratio	Capital output ratio
(1)	(2)	(3)
1. Agriculture	1.5	1.6
2. Forestry & logging	0.3	0.3
3. Fishing	0.7	0.7
4. Mining & quarrying	3.4	4.2
5. Manufacturing	2.3	3.3
5.1 Registered	3.1	4.7
5.2 Unregistered	1.4	1.8
6. Electricity, gas & water supply	27.1	28.5
7. Construction	0.4	0.5
8. Trade, hotels & restaurants	0.5	1.1
8.1 Trade	0.4	1.0
8.2 Hotels & restaurants	2.7	2.7
9. Transport, storage & communication	6.7	7.0
9.1 Railways	23.5	24.0
9.2 Transport by other means	3.5	3.8
9.3 Storage	3.5	3.6
9.4 Communication	4.3	4.6
10. Banking & insurance	0.3	0.3
11. Real estate, ownership of dwellings & business services	12.7	12.7
12. Public administration & defence	5.8 (2.6)*	5.9 (2.7)*
13. Other services	0.9	0.9
14. Total	2.5	2.9

* Excluding roads and bridges

TABLE 22.8: Weights assigned to different inputs to build up indices

Input	Index of cost of construction of					
	roads & bridges	rural residential buildings	urban residential buildings	rural and urban non-residential buildings and other construction works (accounted)	other construc tion works (unacco unted)	general pucca construction
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Cement	8.5	4	11	1	-	11
2. Iron and steel	0.7	4	7	1	-	13
3. Bricks	-	21	18	20	-	16
4. Logs and timber	-	36	27	-	-	21
5. Paints & varnish	-	-	7	-	-	3
6. Glass & glass products	-	-	2	-	-	2
7. Stone	49.3	-	-	-	-	-
8. Lime	-	4	1	-	-	1
9. Sand	1.1	-	-	-	-	-
10. Electrical goods	-	-	3	-	-	3
11. Rural construction worker	-	31	-	13	4	2
12. Urban construction worker	11.0	-	24	-	29	28
13. Rural unskilled worker	28.8	-	-	65	67	-
14. Tools and implements	0.6	-	-	-	-	-