Chapter Five

ESTIMATES OF OUTPUT-CAPITAL RATIO AND CAPITAL INTENSITY IN INDIAN STATES

I. Introduction :

Capital is one of the three major factors of production conventionally classified in economic literature. It is essentially a man-made factor of production. That is perhaps the reason why increasing importance is given to the concept and measurement of this factor of production. In the standard text-books on the subject, capital is defined as a produced means of production. In other words, the concept of capital at a macro-level can be regarded as an aggregate of the multifarious physical objects which have been produced by the economic system in order to help the production of some other commodities. The measurement of the stock of real capital at a point of time, therefore, requires (a) identification, (b) valuation at some base year constant prices, and (c) aggregation of the values so obtained of a large number of physical objects which serve as inputs in the production of final output.

At an empirical level, the measurement of the stock of real capital at a point of time involves two major problems viz., the problem of identification and the problem of valuation of the produced means of production at some base year constant prices. The former can be resolved by preparing a systematic and well defined set of physical objects which constitute the stock of capital. Here also there exist some problems at a conceptual level because there can be some objects with possible alternative uses which may be regarded as capital for some of their uses whereas for other uses, they may simply not fit in our concept of capital, e.g., cars or refrigerators when used for further production are regarded as capital, otherwise they are treated as consumer durables. We may, therefore, have to make an overall adjustment on the basis of some information, if at all it is available.

The second problem of the valuation of these objects at some base year constant prices is all the more important for underdeveloped countries like India where inadequacy of the required type of data sometimes poses insurmountable hurdles in the way of estimating the stock of real capital not only at two points of time but even at one point of time. Comparison of the stock of real capital at two different points of time

involves conceptual difficulties, not only because there exists great heterogeneity of capital goods, but also because the very form of these capital goods constantly changes with the passage of time largely on account of the technological progress. This problem can be partially resolved according to E.F.Denison by taking the value, in base period prices, of the stock of durable capital goods (before allowance for capital consumption) as measuring the amount it would have cost in the base period to produce the actual stock of capital goods existing in the given year (not its equivalent in ability to contribute to production) and the gross additions to the capital stock and capital consumption being valued in terms of base year costs for the particular types of capital goods added or consumed.*1 Here the case of capital goods not actually produced in the base year poses a genuine problem. However, this problem is invariably faced while constructing any type of index number. Therefore, in this context it can be resolved by substituting the amount it would have cost to produce these goods if they had been known and actually

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*1 Cf. E.F.Denison: "Theoretical Aspects of Quality Change, Capital Consumption and Net Capital Formation", in Studies in Income and Wealth, Vol.19 (Princeton: National Bureau of Economic Research, 1957), pp.222-223.

produced in the base year.*2 This concept of capital "corresponds to the essential nature of capital regarded as a factor of production."*3 This definition of the value of the stock of capital, however, is hardly followed rigidly in practice.*4 Our estimates of the stock of real capital for the Indian States may also not be regarded as exception to this generalization.

Moreover, it should be noted that the stock of capital in which we are interested refers to the stock of real capital existing in different States at different points of time rather than the stock of real capital belonging to different States, because the concept of income which we are following is that of income originating in a particular State rather than income accruing to a particular State. At this point, it should be made clear that with respect to the considerations of accuracy and reliability, our estimates of the stock of real capital for different states in India are marred by serious deficiencies arising out of an acute paucity of re-

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2 Ibid.

3 Cf. Joan Robinson: "The Production Function and the Theory of Capital", in Collected Economic Papers, Vol.II, (Oxford: Basil Blackwell, 1960); p.115.

4 Cf. E.F. Denison: Why Growth Rates Differ? (Washington: The Brookings Institution,1967), p.34. Also see B.H. Dholakia : The Sources of Economic Growth in India.(Baroda : Good Companions, 1974) Ch.5.

quired data and a complete lack of even the minimum necessary statistical source material at most of the stages involved. That perhaps could be the main reason why no serious attempt seems to have so far been made in the direction of constructing an estimate of the stock of real capital even at one point of time for different States in India.

In view of this, it is natural to expect that our main task in the present chapter is to fill this vital gap by initiating the effort in the direction of preparing at least some rudimentary estimates of the stock of real capital for each of the fifteen Indian States considered in this study for the two bench-mark years, 1960-61 and 1970-71,*5 which are broadly consistent and comparable in scope and coverage over the period and among the States. The procedure followed for this purpose is to estimate the stock of real capital by detailed sectors of the State economies. The method of estimation, as it is to be expected, differs from sector to sector largely on account of varying degrees of availability of the basic statistical source material for different sectors of the State economies.*6

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*5 Capital stock for the year 1960-61 refers to the stock of capital goods existing on 31st March,1961; and capital stock for the year 1970-71 refers to the stock existing on 31st March,1971.

*6 Two points relating to our estimates of capital stock are worth-mentioning at this stage. In the first place, they exclude general governmental capital or capital stock falling

The next section of the present Chapter is devoted to the derivation of the estimates of net capital stock at 1960-61 constant prices in the years 1960-61 and 1970-71 in the sectors of (i) Agriculture, (ii) Registered manufacturing, (iii) Unregistered manufacturing, (iv) Electricity, gas and water supply and (v) Residential dwellings for the fifteen Indian States. In the third section, then, the estimates of net stock of real capital for the remaining sectors are derived for the fifteen Indian States for the two bench-mark years of 1960-61 and 1970-71. In the fourth section, the capital structure of Indian States is examined for two points of time, viz., 1960-61 and 1970-71; and, the growth rates observed in the stock of real capital over the decade are presented. In the final section of this Chapter, estimates of capital intensity and output-capital ratio by broad sectors in the fifteen States of India are presented.

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under the head "Public Administration" such as public buildings, roads and bridges etc. because consistency of estimates of capital with estimates of income demands its exclusion. For further discussion on this point see B.H.Dholakia: The Sources of Economic Growth in India, op.cit.; E.F. Denison: Why Growth Rates Differ, op.cit., pp.135-146. The second important thing to note about our estimates of the stock of capital for Indian States is that they take no account of the intensity with which capital is actually used in different States and at different times. It is admitted that this is a serious limitation of our estimates of the stock of capital, however, it seems to be almost inevitable. It should be treated as an assumption, therefore, underlying the present study that capital is used with equal degree of intensity in different states and at the two points of time.

II. Estimates of the Net Stock of Capital in Selected Sectors, 1960-61 and 1970-71 :

In this section, we shall derive the estimates of the net stock of real capital in five major sectors out of a total of sixteen standard sectors in different State economies for the years 1960-61 and 1970-71. These sectors are (a) Agriculture (b) Registered manufacturing (c) Unregistered manufacturing (d) Electricity, gas and water supply and (e) Residential Dwellings. We accordingly divide this section into five sub-sections, one for each sector. The reason why these five sectors are treated separately is that some basic statistical source material relevant to our study does exist in one or the other form as far as these five sectors are concerned. On the other hand, practically no information on the basic statistical source material necessary to construct estimates of net stock of capital exists for the remaining sectors of the State economies. However, it is satisfying to note that the above-mentioned five sectors form a substantial part of the various State economies not only in terms of their importance in the State domestic product but also in terms of their capacity to generate employment in the system. Actually, at the all India level, these five sectors account for more than 62% of the total employment and about 67% of

the total net domestic product in 1960-61 according to Brochure on Revised Series of National Product for 1960-61 to 1964-65, issued by the CSO, Govt. of India. Let us now try to derive estimates of net stock of real capital for the years 1960-61 and 1970-71 in each of these sectors.

II-A : Agriculture :

For the purpose of estimation, capital stock in agriculture can be conveniently classified into the following six components: (i) Public Irrigation, (ii) Private Irrigation and other land improvements, (iii) Farm Houses, (iv) Agricultural Implements and Machinery, (v) Livestock and (vi) Working Capital in agriculture. We can estimate the net stock of capital in various State economies by estimating each of the six components of agricultural capital for different States and then by aggregating these components we can derive the total stock of capital in agriculture in the State economies. As it is to be expected, since the basic source of data is different for different components, we have to follow separate methods of estimation to derive the value of these components. Looking to the basic method of estimation, we can group the above six components into the following four broad categories :

(a) Public Irrigation and Private Irrigation : The basic source of data for this category consists of different editions of Indian Agriculture in Brief issued by Directorate of Economics & Statistics, Ministry of Food, Agriculture, C.D. & Co-operation, Government of India. This publication gives data on the classification of land by source of irrigation. Since, the public irrigation consists largely of the irrigation by canals, we can take the area under public irrigation to be equivalent to the area under Government canals. The net area under private irrigation can be obtained by deducting the net area under public irrigation from the total net area under irrigation. These figures for the two bench-mark years by States are presented in the Appendix Table 5A.1 below. In view of complete lack of information on the value of capital in public and private irrigation at the State level, what we can assume is that the value of the capital stock in public irrigation per hectare of area under public irrigation remains the same in each State as the corresponding national average in the base year 1960-61. Similarly, we may assume that the value of capital in private irrigation per hectare of area under private irrigation also remains the same in each State as the corresponding national average in the base year 1960-61. Since the required values of net capital stock in public and

private irrigation at the All-India level for the base year 1960-61 are available from the study by B.H.Dholakia,*7, we can find out the values of the net stock of capital in public and private irrigation for the year 1960-61 for each State.*8

Having derived the values of net stock of capital in public and private irrigation for the base year 1960-61, we can carry these values forward with the help of physical index of net area under public and private irrigation respectively for each state to arrive at the estimate of the stock of real capital in public and private irrigation for the year 1970-71. The estimates of the net stock of real capital in public and private irrigation for the years 1960-61 and 1970-71 (valued at 1960-61 prices) so derived are presented along with other estimates in Appendix Tables 5A.5a and 5A.5b below.

(b) Farm Houses and Agricultural Implements & Machinery : The basic source of data for this category consists of the two surveys conducted by the Reserve Bank of India.*9 However,

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*7 Cf. B.H.Dholakia: The Sources of Economic Growth in India, op.cit., p.159.

*8 For separating Punjab and Haryana in the year 1960-61, we can assume that the growth rate of the category in question remains the same in both these States over the period under consideration as in old Punjab.

*9 These two Surveys are: (1) RBI : "All India Rural Debt and Investment Survey, 1961-62, Tangible Wealth, Capital Expenditure and Capital Formation of Rural Households", Reserve Bank

there are some limitations of these data from our point of view. Firstly, these surveys cover only the rural households. Secondly, they report the value of assets at current prices. Thirdly, the 1961-62 survey (AIRDIS) refers to 31st December, 1961 and the 1971-72 survey refers to 30th June, 1971. Finally, they report the stock of buildings and implements & machinery owned by cultivator and non-cultivator households, but do not provide any information on the stock of buildings and implements & machinery used in farm business by States. However, the 1961-62 Survey (AIRDIS) gives the information on the stock of buildings and implements & machinery used in farm business at the all India level. Applying these proportions obtained at the all India level for the cultivator and non-cultivator households to the reported values in each State in both the years, viz., 1961-62 and 1971-72, we can derive the corresponding estimates of the value at current prices of farm houses and agricultural implements & machinery for rural households in each State for the two years. The estimates of the stock of farm houses so derived are presented, along with the reported figures pertaining to buildings for rural households at current prices for the years 1961-62 and 1971-72, in Appendix Table 5A.2 below. Similar figures for agricultural

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of India Bulletin, June, 1965. This survey is popularly referred to as AIRDIS. (2) RBI: All India Debt and Investment Survey, 1971-72, Assets and Liabilities of Rural Households as on 30th June, 1971, 1976.

implements & machinery and the reported figures on implements & machinery are presented in Appendix Table 5A.3 below.

Having derived the estimates of farm houses and agricultural implements & machinery for the years 1961-62 (i.e., 31st Dec.1961) and 1971-72 (i.e., 30th June, 1971), these figures can be extrapolated and interpolated geometrically to derive corresponding estimates for the year 1960-61 (i.e., 31st March 1961) and 1970-71 (i.e. 31st March 1971). After deriving these estimates, we can convert the 1970-71 figures at current prices into the corresponding figures at constant 1960-61 prices by applying the all India price indexes for buildings & construction and machinery & equipment*10 to the current price estimate of farm houses and agricultural implements & machinery respectively in each State.

Having so obtained the estimates of the stock of real capital in farm houses and agricultural implements & machinery for rural areas, we can derive the corresponding estimates for all areas in each State by assuming that the value of each of these components per agricultural worker in urban areas remains the same as that in rural areas. The estimates of the net stock of real capital in the farm houses and agricultural

*10 These price indexes can be calculated on the basis of information available in The National Accounts Statistics, CSO, February, 1976.

implements & machinery for the two bench-mark years, so derived, are presented along with other estimates in the Appendix Table 5A.5a and Appendix Table 5A.5b below.

(c) Livestock : The basic source of data on livestock in Indian States consists of the above mentioned two surveys by the RBI and the Livestock Census of 1961 and 1971. The two surveys by the RBI gives data on the value of livestock owned by rural households at current prices for the two years 1961-62 and 1971-72. These figures suffer from the same limitations as pointed out earlier in the case of farm houses and agricultural implements & machinery. Moreover, in the case of livestock, we donot have any information contained in the same source regarding the value of livestock actually used in the farm business even at the all India level. We have, therefore, to depend on the study made by B.H. Dholakia*11 for the proportion of livestock used in farm business. Applying this ratio to the reported figures on the value of livestock owned by rural households, we can arrive at the value of livestock used in farm business at current prices for rural households in each State for the years 1961-62 and 1971-72.

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*11 Cf. B.H. Dholakia : The Sources of Economic Growth in India, op.cit.,p.188.

These figures along with the reported figures on the value of livestock for the years 1961-62 & 1971-72 are presented below in Appendix Table 5A.4. Then, we can geometrically extrapolate these figures to get the corresponding figure in each state for 1960-61. Since no price index is available for the category of livestock as a whole, for our purpose we can carry forward the 1960-61 figures on the value of livestock, after making due adjustments to include urban areas also,*12 with the help of the physical index of the total livestock, available for each State from the Livestock Census 1961 and 1971, to get the corresponding estimate of the value of livestock in 1970-71 at 1960-61 prices. The estimates of the net stock of real capital in the form of livestock in 1960-61 and 1970-71 are presented along with other estimates in the Appendix Table 5A.5a and Appendix Table 5A.5b below.

(d) Working Capital in Agriculture : Since no worth-while information is available on the working capital in agriculture not only at the State level but also at the all India level, what we can do is to make a flat assumption as D.H. Dholakia

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*12 We can assume, as we did in the case of farm houses and agricultural implements & machinery that value of livestock per agricultural worker in urban areas remains the same as that in rural areas.

makes in his study, that the stock of working capital in agriculture forms one-tenth of the corresponding net product at 1960-61 prices*13 to derive the estimates of working capital in agriculture at 1960-61 constant prices for the two bench-mark years, 1960-61 and 1970-71. These estimates along with other estimates are presented in the Appendix Table 5A.5a and Appendix Table 5A.5b below.

The aggregate of these six components represents the total net stock of real capital in agriculture for the two years 1960-61 and 1970-71, which are presented below along with other estimates in Appendix Table 5A.13.

II-B : Registered Manufacturing :

The basic source of data for estimating capital stock in this sector of the State economies in India consists of various volumes of the Annual Survey of Industries (ASI), which contain detailed data on the census sector industries; and various reports of the National Sample Survey (NSS) containing data on the sample sector industries. These surveys

*13 Cf. B.H. Dholakia : The Sources of Economic Growth in India, op.cit., p.154. See also RBI: "Estimates of Saving & Investment in the Indian Economy: 1950-51 to 1962-63", RBI Bulletin, March, 1965.

are conducted by the Industrial Statistics wing of the CSO, Department of Statistics, Ministry of Planning, Government of India. However, there are some obvious limitations of data given by these survey reports.

Firstly, the data given by the ASI Census and sample sectors donot exhaust the entire Registered Manufacturing sector because ASI gives data only for the reporting units. Therefore, the ASI data by themselves are not consistent with the income estimates in the Registered Manufacturing sector prepared by the State bureau.

Secondly, the data given by ASI on the fixed capital represent the depreciated book-values of capital assets which hardly make any sense as far as their economic interpretation is concerned because "The reported figures represent a simple aggregation of the actual money values of annual additions to capital stock over a period of time without making any adjustment for price changes over the period. Thus each annual addition to the stock of capital goods gets evaluated at different prices (i.e. at the prices prevailing in the corresponding year) and hence their simple aggregation as such does not yield any meaningful aggregate that can be directly used for economic analysis".*14

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14 B.H.Dholakia : "Measurement of Capital Input and Estimation of Time Series Production Functions in Indian Manufacturing",

Regarding the first limitation of these data, we can take the ASI Census plus Sample sectors less industry groups 511 & 512*15 as comprising a fairly major part of the Registered Manufacturing sector in any State economy in India. In order to get an estimate of the net stock of capital that is consistent with our estimates of income originating from the same sector, we can apply the capital-output ratio obtained from the ASI Census plus sample sectors less industry groups 511 & 512 to our corresponding estimates of the income originating in the Registered Manufacturing sector. This amounts to assuming that the part of the sector not reported by ASI, also has the same capital-output ratio as the one reported by ASI. In the light of the availability and nature of data, this seems to be perhaps the most plausible assumption to make.

Regarding the second limitation of these data, we essentially face two separate problems. One is to get an estimate of the net stock of fixed capital for the bench-mark year 1960-61 at current prices and the other one is to get an estimate of the net stock of fixed capital for the year 1970-71 at 1960-61 constant prices, which is consistent with and comparable to the corresponding estimate for the year 1960-61.

Technical Report No.125 (Mimeo.), Indian Institute of Management, Ahmedabad.

*15 These industry groups fall under the sector Electricity, gas and water supply.

To resolve these two problems, we can follow the so-called "perpetual-inventory" method which consists in preparing a fairly long time series of capital formation at the constant base year prices and cumulating the figures year by year after making deductions for capital consumption.*16 However, in view of the inadequacy and non-availability of the required data to prepare a fairly long time series of fixed capital formation for each state in India, we have to follow the second variant of the perpetual inventory method to resolve the above-mentioned two problems.*17 The second variant "consists in obtaining a bench-mark estimate of net capital stock at base period prices, and then, carrying it forward (or backward) with the help of the estimated capital formation adjusted for depreciation valued at the same base period prices".*18

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*16 Cf. Dr. Goldsmith: "A Perpetual Inventory of National Wealth" Studies in Income and Wealth, Vol.14 (New York: National Bureau of Economic Research,1951). Also see T.Balma: "Alternative Methods of Measuring Capital", in Income and Wealth Series VIII, Raymond Goldsmith and Christopher Saunders (eds.), (London: Lowes & Bowes, 1959); and E. Balboa & A. Fracchia: "Fixed Reproducible capital in Argentina, 1945-55" in Income & Wealth Series VIII, op.cit., pp.274-277.

*17 Cf. B.H. Dholakia : The Sources of Economic Growth in India, op.cit. Ch.V, see also B.H. Dholakia: "Growth of Factor Inputs and Total Factor Productivity in Public Sector Enterprises in India", Technical Report No.120 (Mimeo.), Indian Institute of Management, Ahmedabad.

*18 B.H.Dholakia: "Growth of Factor Inputs and Total Factor Productivity in Public Sector Enterprises in India", op.cit.

To obtain the estimate of the net stock of fixed capital in ASI Census plus Sample sector less industry group 511 & 512 for the bench-mark year 1960-61, we can make the use of price-inflators at all India level for the year 1960-61 estimated by B.H. Dholakia in his study.*[19] These price-inflators at all India level are estimated at 1.6004 for structures & construction and 1.4477 for machinery & equipment. All that we now require is to obtain the value of structures & construction and machinery & equipment for each state in the year 1960-61. However, the data given by ASI at the State level are not so disaggregative and at the disaggregated level where the ASI reports the data by industry and by States, we almost invariably find some of the States being lumped in each industry group. The lumped category of States also does not remain the same for different industries. This practice might have been followed with a view to avoiding identification of individual units.However, the result is that we cannot get the value of structures & construction and machinery & equipment for each State in the year 1960-61.

Under these circumstances, what we can do is to take the composition of structures & construction and machinery &

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19 For the details of estimation of these price-inflators see B.H. Dholakia : The Sources of Economic Growth in India, op.cit., p.186.

equipment in the total fixed capital of those industries for which the required break-up is available at the state level. We may, then, assume that the remaining industries in a given State also have, in aggregate, the same average composition of fixed capital (i.e., break-up into structures & construction and machinery & equipment) as the one obtained by aggregating the separately available industries in that State, and use the composition of fixed capital so obtained as weights to be attached to the price-inflators for structures & construction and machinery & equipment estimated at the all India level to derive an overall price-inflator for the State in question. Appendix Table 5A.6 below gives the proportions (weights) of structures & construction and machinery & equipment in the total fixed capital in the separately given industries along with the overall price-inflator, so derived, in each state.

By applying these price-inflators to the reported figures on total fixed capital in ASI census plus sample sector less the industry groups 511 & 512, we can arrive at the corresponding net stock of fixed capital in 1960-61 at current prices. Adding to this, the corresponding stock of working capital which is reported at current prices only, we can get

the corresponding total net stock of capital. Then by taking the ratio of the stock of capital so derived with the corresponding value added, we get the required estimates of the capital-output ratio for the year 1960-61 for the Registered Manufacturing sector in all the Indian States.*20 These ratios are presented along with other ratios in the Appendix Table 5A.11 below.

Now, the problem of obtaining the estimates for the net stock of fixed capital in the ASI Census plus sample sector less the industry groups 511 & 512 for the year 1970-71, at 1960-61 constant prices, only remains to be resolved. From various ASI annual reports we get the annual additions to the net stock of fixed capital at current prices. All that we require to do here is to convert these annual additions at current prices into 1960-61 constant prices. Again at this stage, there is a huge gap in the availability of data on suitable price deflators at the State level. However, at the All India level, we can derive separate price indexes for Structures & Construction and machinery & equipment for the years 1960-61 to 1970-71 from the National Accounts Statistics, (Feb.,1976) issued by the CSO. These price indexes at all India

*20 The capital output ratios obtained for old Punjab are assumed to apply to both Punjab and Haryana for 1960-61 and 1970-71 for the sectors Registered Manufacturing, Unregistered Manufacturing and Electricity, gas and water supply.

level are presented in Appendix Table 5A.7 below. On the basis of these price indexes, we can derive the whole series of overall price deflators for the fixed capital formation in the manufacturing sector for each State by taking a weighted average of the separate price indexes (given in Appendix Table 5A.7), the weights being the same as the base year weights given in the Appendix Table 5A.6 below. The price--deflators for fixed capital formation in the manufacturing sector, so derived, are presented below in Appendix Table 5A.8.

By applying these price-deflators to the annual additions to the net stock of fixed capital at current prices in ASI census plus Sample sector less 511 & 512 industry groups, we can get the corresponding annual additions at 1960-61 constant prices. By adding these annual additions to the estimated net stock of fixed capital in 1960-61 at current prices, we get the corresponding figure for the year 1970-71 for each State which is consistent with and comparable to the 1960-61 figure. To get the corresponding estimates of the stock of working capital and value Added at the 1960-61 constant prices, we can deflate them with the help of the price index implicit in our income estimates in the Registered Manufacturing sector.

By adding the net stock of fixed capital and the stock of working capital in 1970-71 at 1960-61 prices for the ASI Census plus Sample sector less the industry groups 511 & 512, and then, by dividing the sum by the corresponding value added at 1960-61 constant prices, we can get the estimated real capital-output ratios for the Registered Manufacturing sector in 1970-71 for all the fifteen Indian States. These ratios are presented in the Appendix Table 5A.11 below.

By applying these estimated capital-output ratios to the corresponding real income estimates in the Registered Manufacturing sector for each State presented in Ch.two above, we can derive the estimates of net stock of real capital in the Registered Manufacturing Sector for the two years 1960-61 and 1970-71 in each State in India. The estimates so derived are presented below in Appendix Table 5A.13 along with other estimates.

II-C : Unregistered Manufacturing :

Actually, there does not exist any basic statistical source of data pertaining capital in this sector. However, for the purpose of estimating capital stock in this sector, we can make use of the data on ASI sample sector because the

industries covered by ASI in its Sample sector are on an average small in size and, therefore, can serve as a good proxy for the Unregistered Manufacturing sector. Here, it should be noted, we certainly do not mean to use the capital-output ratio in the ASI Sample sector for the Unregistered Manufacturing sector. All that we need to assume is that the interstate variations in the capital-output ratio in the Unregistered Manufacturing sector remain the same as the interstate variations in the capital-output ratio in the ASI sample sector, because at the all India level, estimates of the capital-output ratio in Unregistered Manufacturing sector for the years 1960-61 and 1970-71 at 1960-61 constant prices are available from a study by Uma Datta Roy Chaudhuri and V.V. Divatia.*[21]

The method of obtaining the estimates of capital-output ratios in Unregistered Manufacturing sector of each State economy in the two years consists in preparing a series of capital-output ratios by States as well as all India for the ASI Sample sector and, then, taking index of these series with all India capital-output ratio as the base and then applying

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21 Cf. Uma Datta Roy Chaudhuri and V.V. Divatia : "Measurement of Distributions of Capital Stock in India" (mimeographed) presented to the Fourteenth General Conference of International Association for Research in Income and Wealth at Aulanko, Finland, during August, 1975.

these indexes to the estimates of capital-output ratios at all India level for the Unregistered Manufacturing sector given by Uma Datta Roy Chaudhury and V.V. Divatia to get the corresponding estimates of capital output ratios in the Unregistered Manufacturing Sector for each State in the two years, 1960-61 and 1970-71.

For this purpose, we require the net stock of fixed capital at 1960-61 prices for the ASI sample sector. The figures reported by ASI represent the depreciated book-values which suffer from the same limitations as already pointed out in the preceding sub-section of the present chapter. Moreover, ASI does not report the composition of fixed capital in the Sample sector by States. Therefore, we can use the same overall price-inflator derived above for the Registered Manufacturing sector for each State*22 to convert the 1960-61 book-values into the net stock of fixed capital at current prices in the ASI Sample sector. Then, adding the stock of working capital to the net stock of fixed capital, so derived, for the year 1960-61, and then, dividing the total net stock of capital by the corresponding value added, we derive the capital-output ratio in the ASI sample sector for the year 1960-61. Similarly,

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*22 Cf. Appendix Table 5A.6 below.

for converting the annual additions to net stock of fixed capital at current prices into 1960-61 constant prices, we can make use of the same price-deflators as obtained in the case of the Registered Manufacturing sector.*23

By adding up the annual additions at constant 1960-61 prices, so derived, to the estimated net stock of fixed capital for the year 1960-61 at current prices in the ASI sample sector, we get the corresponding estimate of the net stock of fixed capital for the year 1970-71 at 1960-61 constant prices. For deflating the stock of working capital and value added, we can use the price indexes implicit in our income estimates for the Unregistered Manufacturing sector. Thus, we can also derive the series of the capital-output ratio by States and all India for the year 1970-71 in the ASI sample sector. By following the methodology described above, therefore, we can prepare the estimates of the capital--output ratios for Unregistered Manufacturing sector for the years, 1960-61 and 1970-71 for each State in India. These ratios are presented below in Appendix Table 5A.11 along with other ratios.

By applying these capital-output ratios to our estimates

*23 Cf. Appendix Table 5A.8 below.

of real income originating in the corresponding State in the Unregistered Manufacturing sector, we arrive at the corresponding estimates of net stock of capital. These estimates are presented below in Appendix Table 5A.13 along with other estimates.

II-D : Electricity, Gas and Water Supply :

The basic source of data on capital in this sector consists of various annual reports of the ASI. The industry groups 511 & 512 reported by the ASI represent a large part of this sector and hence we can follow exactly the same method to estimate net stock of capital in Electricity, gas and water-supply sector as we have followed in the case of the Registered Manufacturing Sector. Since for these industry groups viz., 511 & 512 details about the composition of fixed capital are available at the State level for the year 1960-61*24, we can use the weights to be attached to the

*24 In respect of three States viz., Kerala, Orissa and Tamil Nadu, the details pertaining to the industry groups 511 & 512 are lumped along with the Union Territories Delhi and Tripura since each of these States had only one factory reporting the data. To separate the fixed capital, working capital and value added in these three States, we can use the following method. First of all we can get the total number of factories in each of these individual States for which separate data are not available. Then, we can sum up such factories in each region to get the total of factories for which separate data are not available for one or more of these five regions. Then, we can take the corresponding data on totals of fixed capital, working capital and value added for each State for the number

all India figures based on the reported break-up of fixed capital into structures & construction and machinery & equipment to derive the overall price-inflators in the case of each State for converting the 1960-61 reported book-values of fixed capital into the net stock of fixed capital at current prices for the ASI industry groups 511 & 512. The composition of fixed capital (weights) and the price-inflator so obtained for each State are presented below in Appendix Table 5A.9.

By applying these price-inflators to the reported figures on fixed capital, we can get the net stock of fixed capital in 1960-61, adding the stock of working capital in 1960-61 to which would yield the total net stock of capital in 1960-61 in the ASI industry groups 511 & 512. Taking a ratio of the total net stock of capital to the value added in 1960-61 would gene-

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of factories for which separate data are not available. Thus, we can talk about the per factory value for the category of lumped industries for each State and each aggregate. Then, the regional profile of per factory value (in this category) in relation to average value for each aggregate for all (i.e., five) regions can be assumed to be valid for the industry groups 511 & 512 also, so that it can be applied to the per factory value of the corresponding aggregate for all regions for the industry groups 511 & 512. With the help of the per factory values of the three aggregates so obtained, we can find out total of each aggregate in each State for the industry groups 511 & 512. Applying their percentage distribution to the corresponding reported totals, we can get the estimates of fixed capital, working capital and value added for the three States viz., Kerala, Orissa and Tamil Nadu for the industry groups 511 & 512 in the year 1960-61. For these industry groups, the proportions of structures & construction and Machinery & equipment in fixed capital in these three States can be assumed to be the same as those for the lumped category of the States as a whole.

rate the required estimate of the capital-output ratio in the year 1960-61 for each State. These ratios are presented below in Appendix Table 5A.11 along with other ratios. Applying these ratios to the corresponding estimates of income originating in Electricity, gas & water supply, we arrive at the required estimates of net stock of capital which are presented below in the Appendix Table 5A.13 along with other estimates.

For arriving at the net stock of fixed capital in the ASI industry groups 511 & 512 for the year 1970-71, we have to first of all deflate the reported annual additions to the fixed capital by suitable price-deflators to get the corresponding annual additions at 1960-61 constant prices. These price-deflators for Electricity, gas & water supply can be obtained in the same way as we did for the Registered Manufacturing sector. Inasmuch as the weights in the case of the former are different from those in the case of the latter, the price-deflators in both the cases would differ in a given State. The price-deflators in the case of the Electricity, gas & water supply are presented below in Appendix Table 5A.10. With the help of these price-deflators, we can get the annual additions to the net stock of fixed capital at 1960-61 prices. Adding the annual additions so obtained to the estimated net

stock of fixed capital for the year 1960-61, we arrive at the estimate of net stock of fixed capital for the year 1970-71 at 1960-61 constant prices for the ASI industry groups 511 & 512. To deflate the reported stock of working capital and value added, we can use the price indexes implicit in our income estimates in the sector, Electricity, gas & water supply. Thus, we can obtain the required estimates of the capital-output ratio for 1970-71 in the Electricity, gas & water supply which we can then apply to our estimates of real income originating in that sector to get the corresponding estimates of net stock of real capital for the year 1970-71. Appendix Table 5A.11 below gives the estimated capital-output ratio in this sector in 1970-71 along with other ratios and Appendix Table 5A.13 below gives the estimates of net stock of capital in this sector for 1970-71 along with other estimates.

II-E : Residential Dwellings :

The basic source of data on capital stock in this sector consists of the two surveys made by the RBI.*25 The surveys report the value of the stock of buildings owned by

*25 RBI: AIRDIS 1961-62, op.cit. and RBI : AIDIS 1971-72, op.cit.

rural households at current prices. Out of this, the stock used in farm business is referred to as Farm Houses. We have already separated Farm Houses from the total stock of buildings.[26] The remaining stock of buildings falls under the category of Residential Dwellings in rural areas. By following the same methodology as we did in the case of Farm Houses above, we can get the estimates of the net stock of capital in Residential Dwellings for rural areas in the two bench-mark years of 1960-61 and 1970-71. For the urban areas, however, in the light of complete lack of information, we can use the estimate at the all India level obtained directly from the data given in the Brochure on the Revised Series of National Product, CSO (1967), pp.63-67 for the bench-mark year 1960-61 at current prices to compute the per capita value of Residential Dwelling in urban areas in the year 1960-61. This value turns out to be Rs.470.37 which can be applied to each State in order to get the net stock of capital in Residential Dwellings in urban areas for the year 1960-61. To get the corresponding estimate of net stock of real capital in Residential Dwellings for the year 1970-71, we can assume that the growth of per capita house property in urban areas is the same as that in rural areas over the decade 1960-61 to 1970-71. By applying the per capita house property for 1970-71 so derived to the

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26 Cf. the sub-section II-A of the present chapter above. See also the Appendix Table 5A.9 below.

corresponding urban population of each State in the year 1970-71, we can get the estimate of net stock of real capital in Residential Dwellings. These estimates are presented along with other estimates in Appendix Table 5A.13 below.

III. Estimates of the Net Stock of Capital in Other Sectors, 1960-61 and 1970-71 :

In this section, our primary task is to derive consistent and comparable estimates of the net stock of capital in the following sectors of the different State economies in India for the years 1960-61 and 1970-71 : (1) Forestry & Fishing, (2) Mining & Quarrying, (3) Construction, (4) Railways, (5) Communication, (6) Transport by Other Means, (7) Trade, Storage, Hotels & Restaurants, (8) Banking & Insurance and (9) Other Services. Unfortunately, practically no information exists at the State level in India on the basis of which we can prepare consistent and comparable estimates of the net stock of real capital in these sectors for the two bench-mark years. However, at the all India level, some work has been done in this direction by individual scholars. Two of such studies*27 taken together provide the capital output

*27 cf. Uma Datta Roy Chaudhury and V.V. Divatia: "Measurement of Distributions of Capital Stock in India", op.cit.; and also, B.H.Dholakia: The Sources of Economic Growth in India, op.cit.

ratios for all the nine sectors mentioned above at 1960-61 constant prices. For seven of the nine sectors mentioned above, viz., Mining & Quarrying, Railways, Communications, Transport by other Means, Trade, Storage, Hotels & Restaurants, Banking & Insurance and other services, the study made by Uma Datta Roy Chaudhury and V.V. Divatia gives the capital-output ratios at 1960-61 prices for the required two years, 1960-61 and 1970-71 at the all India level. For the remaining two sectors, viz., Forestry & Fishing and construction, the study made by B.H. Dholakia gives the estimates of the capital-output ratio at 1960-61 prices for the year 1960-61 at the all India level. In the light of non-availability of data, we can assume that the capital-output ratios at 1960-61 prices in these two sectors remain the same in 1970-71 as in 1960-61. These capital-output ratios at all India level by the nine sectors for two years - 1960-61 and 1970-71 - are presented below in Appendix Table 5A.12.

To derive the estimates of the net stock of real capital in these nine sectors in each State, we can assume that the capital-output ratio at 1960-61 prices in each one of the individual sectors remains the same in all States. In other words, we assume that the all India sector-wise capital-output

ratio applies to all states in the respective years. With the help of the estimates of real income originating in these sectors in different State economies, we can arrive at the estimates of net stock of real capital in these sectors of the State economies in India. These estimates are presented along with other estimates in the Appendix Table 5A.13 below.

IV. Growth and Structure of Capital Stock in Indian States :

Having derived the estimates of the net stock of capital by detailed sectors for each of the fifteen states for the years 1960-61 and 1970-71, let us now examine the broad structure of the stock of capital in each State. Table 5.1a and Table 5.1b represent the structure of the net stock of capital in Indian States for the years 1960-61 and 1970-71, respectively. From the Tables, it becomes obvious that there are significant variations in the capital structure of different State economies. Share of primary sector in the total stock of capital varies all the way from 44.60% in Punjab to as low as 15.93% in West Bengal in 1960-61. If we add up the estimated capital stock of all the fifteen States, the share of the primary sector in the resulting total (average

Table 5.1a

Estimates of Net Stock of Capital (at current prices) by Broad Sectors for the year 1960-61

States	Net Stock of Capital in Rs.lakhs in				Percentage Distribution of Net Stock of Capital			
	Primary sector	Secondary sector	Tertiary sector	Total	Primary sector	Secondary sector	Tertiary sector	Total
1.Andhra	103567	34147	135382	273096	37.92	12.50	49.58	100.00
2.Assam	27702	13286	33171	74159	37.35	17.92	44.73	100.00
3.Bihar	84359	53578	131845	269782	31.27	19.86	48.87	100.00
4.Gujarat	49333	43797	100761	193891	25.44	22.59	51.97	100.00
5.Haryana	38097	7700	39866	85663	44.47	8.99	46.54	100.00
6.Karnataka	49127	25811	90775	165713	29.65	15.58	54.77	100.00
7.Kerala	19081	14675	60812	94568	20.18	15.52	64.30	100.00
8.Madhya Pradesh	70438	40162	99441	210041	33.54	19.12	47.34	100.00
9.Maharashtra	67949	83053	177279	328281	20.70	25.30	54.00	100.00
10.Orissa	39579	15883	39847	95309	41.53	16.66	41.81	100.00
11.Punjab	64382	13795	66169	144346	44.60	9.56	45.84	100.00
12.Rajasthan	77851	27910	74463	180224	43.20	15.49	41.31	100.00
13.Tamil Nadu	85484	43446	138059	266989	32.02	16.27	51.71	100.00
14.U.P.	202436	60156	251361	513953	39.39	11.70	48.91	100.00
15.W.Bengal	55146	98217	192846	346209	15.93	28.37	55.70	100.00

Source : Appendix Table 5A.13 below.

Table 5.1b

Estimates of Net Stock of Capital (at 1960-61 prices) by Broad Sectors for the year 1970-71

States	Net Stock of Capital in Rs. lakhs in				Percentage Distribution of Net Stock of Capital			
	Primary sector	Secondary sector	Tertiary sector	Total	Primary sector	Secondary sector	Tertiary sector	Total
1	2	3	4	5	6	7	8	9
1. Andhra	114637	71261	177544	363442	31.54	19.61	48.85	100.00
2. Assam	30484	34602	52082	117168	26.02	29.53	44.45	100.00
3. Bihar	93665	107931	216051	417647	22.43	25.84	51.73	100.00
4. Gujarat	72950	76437	149647	299034	24.40	25.56	50.04	100.00
5. Haryana	51438	25959	50526	127923	40.21	20.29	39.50	100.00
6. Karnataka	65579	57829	166866	290274	22.59	19.92	57.49	100.00
7. Kerala	26049	30315	107545	163909	15.89	18.50	65.61	100.00
8. M.P.	90183	85963	154608	330754	27.27	25.99	46.74	100.00
9. Maharashtra	82075	182713	297430	562218	14.60	32.50	52.90	100.00
10. Orissa	46671	51371	53976	152018	30.70	33.79	35.51	100.00
11. Punjab	93301	30659	86709	210669	44.29	14.55	41.16	100.00
12. Rajasthan	93216	39202	103585	236003	39.50	16.61	43.89	100.00
13. Tamil Nadu	91893	105172	188755	385820	23.82	27.26	48.92	100.00
14. U.P.	271560	135644	365714	772918	35.13	17.55	47.32	100.00
15. W.Bengal	64840	158579	307553	530972	12.21	29.87	57.92	100.00

Source : Appendix Table 5A.13 below.

share/ as it may be called) turns out to be 31.91% in the year 1960-61. Andhra Pradesh, Assam, Haryana, Madhya Pradesh, Orissa, Punjab, Rajasthan and Uttar Pradesh are the States where the share of primary sector in the total stock of capital turns out to be greater than the average; in Bihar and Tamil Nadu, the share of primary sector is almost equal to the average and in the remaining States, the share of primary sector is less than the average for the year 1960-61.

The average share of primary sector in the total net stock of capital for all the fifteen States taken together has declined from 31.91 per cent in 1960-61 to 25.97% in 1970-71. The decline in the share of primary sector over the decade is observed in each State though the extent differs significantly from State to State. A remarkable thing to note, however, is that in 1970-71 also Punjab and West Bengal continue to occupy, respectively, the top and the bottom place in terms of the relative share of primary sector in the total capital stock. Moreover, the same eight States which had an above average share of primary sector in total capital in 1960-61 continue to have an above-average share of primary sector in 1970-71 also.

As far as the share of secondary sector in total stock of capital is concerned, it varies all the way from 28.37% in West Bengal to 8.99% in Haryana in 1960-61. On an average, the share of secondary sector in total stock of capital turns out to be 17.75% in 1960-61. Only in six States viz., Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, and West Bengal the share of secondary sector in total capital is lying above the average in 1960-61. In the remaining States, it is below the average. Secondly, the share of secondary sector in total capital has increased considerably from 17.75% in 1960-61 to 24.06 in 1970-71 on the average. In each and every State, we find a rise in the share of secondary sector in the total capital between 1960-61 and 1970-71. There is, therefore, a systematic structural transformation of capital stock in favour of the secondary sector in each State economy in India during the sixties.

In 1970-71, the share of secondary sector in total capital varies from 33.79% in Orissa to 14.55% in Punjab. In Orissa, there is a steep rise in the importance of the secondary sector during the sixties, implying thereby that a large amount of investment was diverted into the secondary sector of the Orissa State economy. In Tamil Nadu also, the

importance of the secondary sector has increased significantly during the sixties. Thus, in 1970-71, we have in all eight States, viz., Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu and West Bengal, where the share of secondary sector in total capital is greater than the average.

The share of tertiary sector in the total stock of capital has fallen marginally from 50.34% in 1960-61 to 49.97% in 1970-71 on an average. However, in Bihar, Karnataka, Kerala and Rajasthan the share of tertiary sector in total capital has increased between 1960-61 and 1970-71. In the remaining States, it has declined, though the extent of decline differs from State to State.

A related issue in the examination of the changes in the capital structure of the State economies, is the growth of capital stock in different sectors of the State economies. Table 5.2 presents the growth of capital stock by broad sectors in the fifteen Indian States between 1960-61 and 1970-71. On an average, the real capital stock has grown by 24.55% in the primary sector, 107.37% in the secondary sector and 51.87% in the tertiary sector between 1960-61 and 1970-71. Total real stock of capital, on an average, has grown by about

Table 5.2

Growth of the Net Stock of Capital (at 1960-61 prices) in Indian States between 1960-61 and 1970-71.

(In per cent)

States	Average Rate of Growth per Decade				Average Annual Compound Rate of Growth			
	Primary sector	Secondary sector	Tertiary sector	Total	Primary sector	Secondary sector	Tertiary sector	Total
1	2	3	4	5	6	7	8	9
1. Andhra	10.69	108.69	31.14	33.08	1.02	7.63	2.74	2.89
2. Assam	10.04	160.44	57.01	58.00	0.96	10.04	3.72	4.29
3. Bihar	11.03	101.45	63.87	54.81	1.05	7.25	5.06	4.46
4. Gujarat	47.87	74.53	48.52	54.23	3.98	5.72	4.03	4.42
5. Haryana	35.02	237.13	26.74	49.33	3.04	12.92	2.39	4.09
6. Karnataka	33.49	124.05	83.82	75.17	2.93	8.40	6.27	5.76
7. Kerala	36.52	106.58	76.85	73.32	3.16	7.52	5.86	5.65
8. M.P.	28.03	114.04	55.48	57.47	2.50	7.90	4.51	4.64
9. Maharashtra	20.79	120.00	67.78	71.26	1.90	8.20	5.31	5.52
10. Orissa	17.92	223.43	35.46	59.50	1.66	12.45	3.08	4.77
11. Punjab	44.92	122.25	31.04	45.95	3.77	8.31	2.74	3.85
12. Rajasthan	19.74	40.46	39.11	30.95	1.81	3.45	3.35	2.73
13. Tamil Nadu	7.50	142.08	36.72	44.51	0.72	9.24	3.17	3.75
14. U.P.	34.15	125.49	45.49	50.39	2.98	8.47	3.82	4.16
15. W.Bengal	17.58	61.46	59.48	53.37	1.63	4.59	2.58	3.05

Source : Table 5.1a and Table 5.1b above.

53% between 1960-61 and 1970-71. In each State, we find that the growth of capital stock in the primary sector is far less than that of the total stock of real capital in the economy and the growth of the real stock of capital in the secondary sector is far in excess of the growth of total capital in the economy between 1960-61 and 1970-71. The result is obvious that in each state, the importance of primary sector in the total stock of real capital is declining and that of the secondary sector is increasing during the sixties.

As far as the growth of capital stock in the primary sector is concerned, it varies all the way from 47.87% in Gujarat to as low as 7.50% in Tamil Nadu. In seven States, viz., Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Punjab and Uttar Pradesh, the stock of real capital in the primary sector is growing at a faster rate than the average. It is interesting to note here that out of these seven States only four, viz., Haryana, Madhya Pradesh, Punjab and Uttar Pradesh had an above average share of primary sector in total capital. In the remaining three States, viz., Gujarat, Karnataka and Kerala, the share of primary sector in total capital was less than the average. In the case of the secondary sector, the highest growth of capital was experienced by Haryana

(237.13%) whereas the lowest growth was experienced by Rajasthan (40.46%). Only in five States, viz., Bihar, Gujarat, Kerala, Rajasthan and West Bengal, the growth of capital stock in the secondary sector is less than the average. In the remaining states, the growth of capital stock in the secondary sector is greater than the average.

When we talk about the growth of total stock of real capital in the State economies in India, we find that in about eight States, viz., Assam, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra and Orissa, the growth of total stock of real capital is greater than the growth of total stock of real capital on an average. In West Bengal, the capital stock grows nearly at the same rate as the average. In the remaining States, the growth of total capital stock lags behind the average during the sixties. The highest growth of total capital stock is experienced by Karnataka, while the lowest growth of total capital stock is experienced by Rajasthan. In Rajasthan, the growth of capital stock lags behind the corresponding average in all the three sectors of the economy, and in Karnataka, the growth of capital stock is greater than the corresponding average in all the three sectors. Thus, Rajasthan represents a case for special attention in

Table 5.3

Per Capita Stock of Real Capital in Indian States, 1960-61 and 1970-71

(Rs. at 1960-61 prices)

States	Per Capita Stock of Real Capital Year 1960-61	Year 1970-71
1	2	3
1. Andhra	759(8)	835(6)
2. Assam	625(4)	734(2)
3. Bihar	581(3)	741(3)
4. Gujarat	940(12)	1120(12)
5. Haryana	1128(14)	1275(14)
6. Karnataka	703(7)	991(10)
7. Kerala	559(2)	768(4)
8. M.P.	649(5)	794(5)
9. Maharashtra	830(10)	1115(11)
10. Orissa	543(1)	693(1)
11. Punjab	1296(15)	1555(15)
12. Rajasthan	894(11)	916(8)
13. Tamil Nadu	793(9)	936(9)
14. U.P.	697(6)	875(7)
15. W.Bengal	991(13)	1198(13)

Note: Figures in brackets indicate the rankings in ascending order.

Source: Table 5.1 above.

terms of well-directed investment programmes to step up the rate of capital formation.

Before we pass on to the next section, let us briefly examine the trend in the capital-inequality among different States in India. By capital-inequality is meant the extent by which the per capita capital stock differs among different States. Table 5.3 presents the per capita stock of real capital in the fifteen Indian States in 1960-61 and 1970-71. The table clearly reveals that the per capita availability of capital in each State has increased between 1960-61 and 1970-71, though the extent of increase differs from State to State. Moreover, in 1960-61, Orissa had the lowest per capita stock of real capital (Rs.543) and Punjab had the highest per capita stock of real capital (Rs.1296). The ratio of the highest per capita capital stock to the lowest per capita capital stock turns out to be 2.39 in 1960-61. In 1970-71 also, Orissa had the lowest per capita stock of real capital (Rs.693) and Punjab had the highest per capita stock of real capital (Rs.1555). The ratio of the highest to lowest per capita capital stock turns out to be 2.24 in 1970-71. Thus, the relative range of inter-state variations in the per capita real capital stock has contracted between 1960-61 and 1970-71.

If we take the standard measure of inequality, viz., the Gini's Coefficient or the Lorenz Ratio, we find that in 1960-61, the Gini's Coefficient for the capital inquality turns out to be only 11.57%. As compared to the Gini's Coefficient for the income inequality in 1960-61 of the order of 12.93%, the capital inequality among the Indian States seems to be less accute even in 1960-61. In 1970-71, the Gini's Coefficient of capital inequality turns out to be only 10.67%. Thus, over the period 1960-61 to 1970-71, the capital inequality among the Indian States seems to have been reduced significantly. The investment efforts in India during 1960-61 to 1970-71 have thus succeeded in achieving a reduction in the capital inequality among different States.

It is interesting to note in this connection that the above observation stands in sharp contrast to an equally interesting observation already made earlier that the income inequalities have increased during the same period under consideration.*[28] It has clearly two implications. One is that, from a short run viewpoint, the investments during the sixties have not been made in a way which would maximize the growth of the entire economy. In other words, the considerations of equity have weighed more with our planners than the considerations of growth during the sixties. The second implication is

*28 cf. Chapter 3 above.

that the widening of the income inequalities among states is not likely to continue for a long period of time in India since the capital inequalities show a decline over the period under consideration. If the capital inequality among different States in India would have increased over the period, it would have been a bad guess to say that the income inequalities are not likely to widen further. But if we believe in the relationships between the creation of infra-structure and the process of development and if we also believe in the lagged response of the output to the investment, we may not reject the contention that in the near future, the income-inequalities among the States of India will at least be constant - if not show a downward trend.

V. Capital Intensity and Output-Capital Ratio in Indian States

Before we conclude this Chapter, let us now work out the capital intensity and output-capital ratio in the fifteen States of India in the years 1960-61 and 1970-71. By capital intensity we mean the value of real capital stock per worker. In Chapter 4 above, we have derived the estimates of workers by broad sectors in the fifteen States of India in 1960-61 and 1970-71; and in the present Chapter, we have derived the

Table 5.4

Estimates of Capital Intensity* in Indian States, 1960-61 and 1970-71

(Rs. at 1960-61 prices)

States	Year 1960-61				Year 1970-71			
	Primary Sector	Secondary Sector	Teriary Sector	Total	Primary Sector	Secondary Sector	Tertiary Sector	Total
1	2	3	4	5	6	7	8	9
1. Andhra	757	1542	4891	1463	703	2878	5320	1643
2. Assam	689	3097	4842	1444	626	12270	5905	1943
3. Bihar	551	3141	5966	1403	527	8264	12445	2007
4. Gujarat	809	4567	7111	2288	995	5773	8591	2875
5. Haryana	1795	3235	7696	2976	1955	7481	8478	3579
6. Karnataka	611	2171	6044	1545	673	3913	8723	2210
7. Kerala	726	1329	3204	1680	722	2493	6015	2479
8. M.P.	508	2875	5990	1241	542	5731	8290	1653
9. Maharashtra	496	3552	6071	1732	523	6249	8096	2521
10. Orissa	678	2643	3253	1244	642	8367	5190	1703
11. Punjab	3178	2218	8089	4165	3538	5494	8758	5034
12. Rajasthan	992	4294	6863	1880	1095	4913	7730	2216
13. Tamil Nadu	877	1940	4098	1739	768	4249	5817	2181
14. U.P.	912	2420	6025	1781	1047	5161	7954	2331
15. W.Bengal	824	4740	6853	2990	839	7882	10765	4216
Total	773	2643	5616	1771	812	5441	7843	2338

* Based on the figures of Capital Stock Valued at 1960-61 prices.

Source: Table 5.1, Table 4.8 and Table 4.11 above

estimates of the value of real capital stock by broad sectors in 1960-61 and 1970-71 in the Indian States. Table 5.4 presents the estimates of capital intensity by broad sectors in the fifteen Indian States for the years 1960-61 and 1970-71. It can be seen from the table that on an average, in 1960-61, the capital intensity was Rs.773 in the primary sector, Rs.2843 in the secondary sector, Rs.5616 in the tertiary sector and Rs.1771 in all sectors taken together. For the whole economy, only in six states, viz., Gujarat, Haryana, Punjab, Rajasthan, Uttar Pradesh and West Bengal, the capital intensity was greater than the average. In the remaining States the capital intensity turned out to be less than the average in 1960-61.

Another thing to observe from the Table 5.4 is that in each State, the capital intensity has increased for the economy as a whole between 1960-61 and 1970-71. On an average, in 1970-71, the capital intensity was Rs.812 in the primary sector, Rs.5441 in the secondary sector, Rs.7843 in tertiary sector and Rs.2338 in all sectors taken together. Thus, in each sector we find an increase in the capital intensity between 1960-61 and 1970-71, on an average. Although in the secondary and the tertiary sectors, and hence in the economy as a whole, the capital intensity has increased between 1960-61 and

1970-71 in each of the fifteen States of India, in the primary sector, it has not increased in all the States of India. In six States, viz., Andhra Pradesh, Assam, Bihar, Kerala, Orissa and Tamil Nadu, the capital intensity in the primary sector has declined between 1960-61 and 1970-71. On an average, the highest increase in the capital intensity has taken place in the secondary sector and the lowest increase in capital intensity has taken place in the primary sector during the sixties.

Turning our attention to the output-capital ratios in the fifteen States of India, we can derive them for the broad sectors from the estimates of State Domestic Product at 1960-61 prices (output) by broad sectors available in Chapters two & three above and the estimates of real capital stock by broad sectors as given in the present Chapter. Table 5.5 presents the output-capital ratio by broad sectors in the fifteen Indian States for the years 1960-61 and 1970-71. On an average, the output-capital ratio in 1960-61 turns out to be 0.6374 in the primary sector, 0.4564 in the secondary sector, 0.2373 in the tertiary sector and 0.4038 for all sectors taken together. In seven States, viz., Assam, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu and West Bengal, the output-capital ratio turns out to be greater than the average in

Table 5.5

Estimates of the Output-Capital Ratios* In Indian States, 1960-61 and 1970-71

States	Year 1960-61				Year 1970-71			
	Primary sector	Secondary sector	Tertiary sector	Total	Primary Sector	Secondary Sector	Tertiary Sector	Total
1	2	3	4	5	6	7	8	8
1. Andhra	0.5547	0.4433	0.2395	0.3845	0.6084	0.3357	0.2621	0.3858
2. Assam	0.9589	0.4394	0.2740	0.5595	1.0418	0.3488	0.2576	0.4885
3. Bihar	0.6715	0.3899	0.2148	0.3924	0.6562	0.2797	0.1563	0.3003
4. Gujarat	0.6220	0.5040	0.2390	0.3963	0.7033	0.3928	0.2362	0.3902
5. Haryana	0.4215	0.6074	0.1659	0.3193	0.5468	0.4022	0.2243	0.3901
6. Karnataka	0.8489	0.4897	0.2312	0.4546	0.8844	0.5664	0.2599	0.4621
7. Kerala	1.3146	0.5039	0.2429	0.4996	0.9595	0.4769	0.2260	0.3890
8. M.P.	0.6989	0.3867	0.1973	0.4017	0.6183	0.2895	0.1843	0.3300
9. Maharashtra	0.9764	0.4977	0.2910	0.4852	0.6919	0.3724	0.2698	0.3647
10. Orissa	0.6196	0.3598	0.2330	0.4147	0.7522	0.1820	0.2705	0.3885
11. Punjab	0.3402	0.6943	0.1542	0.2888	0.3927	0.4618	0.1939	0.3209
12. Rajasthan	0.3915	0.3613	0.2093	0.3116	0.5318	0.3033	0.2323	0.3624
13. Tamil Nadu	0.6889	0.5052	0.2814	0.4483	0.7188	0.3617	0.2963	0.4148
14. U.P.	0.5171	0.4066	0.1835	0.3410	0.4833	0.2615	0.1678	0.2951
15. W.Bengal	0.8903	0.4626	0.3096	0.4456	0.8988	0.3935	0.2596	0.3777
Total	0.6374	0.4564	0.2373	0.4036	0.6324	0.3503	0.2297	0.3633

* Based on the figures of output and capital stock valued at 1960-61 prices.

Source: Table 5.1 and Tables 3.3 & 3.4 above.

1960-61. Thus, only in West Bengal, the capital intensity and output-capital ratio for the economy as a whole were higher than the average in 1960-61. On the other hand, in Andhra Pradesh, Bihar and Madhya Pradesh, both the capital intensity and output-capital ratio for the economy as a whole were less than the average in 1960-61.

In 1970-71, the output-capital ratio on an average was 0.6324 in the primary sector, 0.3503 in the secondary sector, 0.2297 in the tertiary sector and 0.3633 for all sectors taken together. Thus, between 1960-61 and 1970-71, on an average, in each sector and hence for the whole economy, the output-capital ratio has declined. The maximum decline is experienced by the secondary sector, while the minimum decline is experienced by the primary sector. However, the direction of change in the output-capital ratio is not uniform in all the States for the economy as a whole in general, and, in the primary sector and the tertiary sector in particular. In the case of the secondary sector, the output-capital ratio has fallen in each State except Karnataka where it has significantly increased during the sixties. For the economy as a whole, in five States, viz., Andhra Pradesh, Haryana, Karnataka, Punjab and Rajasthan, the output-capital ratio has actually increased between 1960-61 and 1970-71. Out of these five States, only

in Karnataka, the output-capital ratio has increased in all the three sectors between 1960-61 and 1970-71. In the remaining four States, the output-capital ratio has increased only in the primary & the tertiary sectors between 1960-61 and 1970-71. On the other hand, in Bihar, Kerala, Madhya Pradesh, Maharashtra and Uttar Pradesh the output-capital ratio declined in all the three sectors of the economy between 1960-61 and 1970-71.

Thus, on the whole, the experience in India during the sixties does not support the hypothesis that capital-output ratio has a tendency to decline with development.*29 Only five out of fifteen States show a decline in the capital-output ratio over the decade. The remaining ten States and hence the total show a clear rise in the overall capital-output ratio between 1960-61 and 1970-71. On the one hand, capital intensity has clearly increased in all the States over the decade; and on the other hand, we find a fall in the capital productivity (i.e. output-capital ratio) in as many as ten States. This only implies that in a very broad sense, the law of variable proportions is in operation in those ten States, while technological advance in the remaining five States is strong enough to overcome the effects of the law of variable proportions.

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*29. See H.Leibenstein: Economic Backwardness and Economic Growth, Studies in the Theory of Development. (New York: John Wiley and Sons Inc.,1957).

Appendix Table 5A.1

Net Area Irrigated Through Public and Private Sources

(in '000 Hectares)

States	Public Irrigation		Private Irrigation	
	1960-61	1970-71	1960-61	1970-71
1	2	3	4	5
1. Andhra	1319	1579	1590	1734
2. Assam	72	72	539	537
3. Bihar	535	812	1527	1348
4. Gujarat	65	204	618	1005
5. Haryana	879	951	250	581
6. Karnataka	231	419	627	718
7. Kerala	153	201	203	230
8. M.P.	438	709	485	771
9. Maharashtra	213	280	860	1147
10. Orissa	197	231	780	918
11. Punjab	1122	1286	844	1602
12. Rajasthan	535	756	1217	1376
13. Tamil Nadu	880	883	1583	1709
14. U.P.	1991	2497	3083	4693
15. W.Bengal	391	629	960	860
All India	9096	11594	15525	19698

Source : Indian Agriculture in Brief; Indian Agricultural Statistics, 1967-68 & 1968-69 and 1967-68 to 1969-70, (Issued by Ministry of Food and Agriculture, Govt. of India)

Appendix Table 5A.2

Value of Assets Owned by Rural Households - Buildings & Structures (Rs.lakhs at current prices)

States	Reported Stock as on 31st Dec.1961				Reported Stock as on 30th June 1971				Total Stock of Farm Houses	
	Cultivators		Non-cultivators		Cultivators		Non-cultivators			
	Total	Used in Farm Business	Total	Used in Farm Business	Total	Used in Farm Business	Total	Used in Farm Business	1961	1971
1	2	3	4	5	6	7	8	9	10	11
1. Andhra	48500	9880	11500	1287	69804	12781	17946	2008	10167	14789
2. Assam	13500	2472	2900	325	31924	5845	2281	255	2797	6100
3. Bihar	61900	11334	8100	906	156469	28650	13539	1515	12240	30165
4. Gujarat	35000	6409	9500	1063	74137	13575	18666	2089	7472	15664
5. Haryana	-	-	-	-	32875	6019	8044	900	4434*	6919
6. Karnataka	36100	6610	7000	783	94451	17294	8977	1005	7393	18299
7. Kerala	27200	4980	1000	112	75004	13733	1275	143	5092	13876
8. M.P.	42500	7782	4500	504	91936	16833	7847	878	8286	17711
9. Maharashtra	38000	6958	6500	727	89923	16465	12480	1397	7685	17862
10. Orissa	22900	4193	5400	604	36931	6762	4808	538	4797	7300
11. Punjab	-	-	-	-	41213	7546	25669	2872	6676*	10418
12. Rajasthan	32900	6024	5100	571	64319	11777	7302	817	6595	12594
13. Tamil Nadu	37600	6885	12100	1354	54551	9988	21191	2371	8239	12359
14. U.P.	142700	26128	17800	1992	305185	55879	46348	5186	28120	61065
15. W.Bengal	33600	6152	10700	1197	86756	15885	21683	2426	7349	15311
Old Punjab	50900	9320	16000	1790	—	—	—	—	11110	17337

* See footnote 8 above.

Source: RBI: AIRDIS, 1961-62 and AIDIS, 1971-72.

Appendix Table 5A.3

Value of Assets Owned by Rural Households - Implements, Machinery & Other Equipments

(Rs. lakhs at current prices)

States	Reported Stock as on 31st Dec. 1961				Reported Stock as on 30th June 1971				Total Stock used in Farm Business	
	Cultivators		Non-Cultivators		Cultivators		Non-cultivators		1961	1971
	Total Assets	Assets used in Farm Business	Total Assets	Assets used in Farm Business	Total Assets	Assets Used in Farm Business	Total Assets	Assets Used in Farm Business		
1	2	3	4	5	6	7	8	9	10	11
1. Andhra	6600	5145	800	115	14405	11228	1780	257	5260	11485
2. Assam	1400	1091	200	29	2783	2169	305	44	1120	2213
3. Bihar	4800	3742	600	87	13391	10438	468	67	3829	10505
4. Gujarat	8700	6782	1400	202	24863	19381	2413	348	6984	19729
5. Haryana	-	-	-	-	8787	6849	821	118	2098*	6967
6. Karnataka	5500	4287	500	72	14021	10929	698	101	4359	11030
7. Kerala	1600	1247	300	43	5103	3978	532	77	1290	4055
8. M.P.	8600	6704	500	72	13707	10685	534	77	6776	10762
9. Maharashtra	9800	7639	700	101	21926	17091	1113	161	7740	17252
10. Orissa	2500	1949	200	29	2816	2195	264	38	1978	2233
11. Punjab	-	-	-	-	16777	13078	1365	197	3999*	13275
12. Rajasthan	7100	5534	200	29	11901	9277	737	106	5563	9383
13. Tamil Nadu	7400	5768	1300	187	16639	12970	2291	330	5955	13300
14. U.P.	16600	12940	1200	173	46183	36000	3010	434	13113	36434
15. W.Bengal	2800	2183	1000	144	7584	5912	720	104	2327	6016
Old Punjab	7600	5924	1200	173	-	-	-	-	6097	20242

* See footnote 8 above. Source: RBI : AIRDIS, 1961-62 and AIDIS, 1971-72.

T-52

Appendix Table 5A.4

Value of Livestock Owned by Rural Households

(Rs. lakhs at current prices)

States	Reported Value as on 31st Dec.1961		Reported value as on 30th June,1971	
	Total	Used in Farm Business	Total	Used in Farm Business
1	2	3	4	5
1. Andhra	21300	19703	36149	33438
2. Assam	6900	6383	13147	12161
3. Bihar	19100	17668	47583	44014
4. Gujarat	18200	16835	42842	39629
5. Haryana	-	8241*	18321	16947
6. Karnataka	14400	13320	35881	33190
7. Kerala	2200	2035	3668	3393
8. M.P.	32100	29693	63419	58663
9. Maharashtra	22800	21090	41915	38771
10. Orissa	8400	7770	12568	11625
11. Punjab	-	11462*	25480	23569
12. Rajasthan	27000	24975	51259	47415
13. Tamil Nadu	12000	11100	18629	17232
14. U.P.	48500	44863	119401	110446
15. W.Bengal	10500	9713	21411	19805
Old Punjab	21300	19703	43801	40516

* See foot-note 8 above.

Source: RBI : AIRDIS, 1961-62 and AIDIS, 1971-72.

Appendix Table 5A.5a

Estimates of the Stock of Capital in Agriculture at 1960-61 Prices for the year 1960-61

(Rs. in lakhs)

States	Public Irriga-tion	Private Irriga-tion	Farm Houses	Implements & Machi-nery	Live-stock	Working capital
1	2	3	4	5	6	7
1. Andhra	24463	37126	10169	5093	19467	5572
2. Assam	1335	12585	2636	1064	6083	2502
3. Bihar	9922	35655	11514	3570	16605	5501
4. Gujarat	1206	14430	7248	6613	16178	3001
5. Haryana	16302	5837	4372	1947	7949	1596
6. Karnataka	4284	14640	7193	4234	12952	3980
7. Kerala	2838	4740	4851	1215	2017	2404
8. M.P.	8123	11324	7904	6620	28503	4574
9. Maharashtra	3950	20081	7419	7497	20747	6448
10. Orissa	3654	18213	4673	1973	7579	2333
11. Punjab	2080	19707	6661	3754	11186	2181
12. Rajasthan	9922	28416	6387	5442	24201	2998
13. Tamil Nadu	16321	36962	8304	5814	11158	5770
14. U.P.	36926	71986	26660	12187	42106	10227
15. W.Bengal	7252	22415	6891	2176	9257	4655

Source : See the text.

Appendix Table 5A.5b

Estimates of the Stock of Capital in Agriculture at 1960-61 Prices for the year 1970-71

(Rs. in lakhs)

States	Public Irrigation	Private Irrigation	Farm Houses	Implements & Machinery	Live-Stock	Working Capital
1	2	3	4	5	6	7
1. Andhra	29285	40488	8775	7268	19718	6730
2. Assam	1335	12538	3502	1374	5756	2854
3. Bihar	15059	31475	17338	6492	15175	5919
4. Gujarat	3785	23466	9250	12460	18155	5050
5. Haryana	17637	13565	4085	4343	8886	2800
6. Karnataka	7771	16765	10929	7100	14052	5436
7. Kerala	3728	5370	8171	2565	2119	2316
8. M.P.	13149	18002	10265	6782	30341	4879
9. Maharashtra	5192	26762	10501	10953	20996	5452
10. Orissa	4285	21435	4253	1415	9165	3211
11. Punjab	23851	37406	6220	8370	13652	3648
12. Rajasthan	14021	32129	7372	5944	28079	4875
13. Tamil Nadu	16377	39904	7530	8644	10859	6379
14. U.P.	46311	109543	35175	22479	41846	12772
15. W.Bengal	11666	20080	10544	3732	10292	5518

Source : see the text.

Appendix Table 5A.6

Composition of Fixed Capital and Price Inflators for Registered Manufacturing Sector

States	Share in Fixed Capital of Structures & Construction	Share in Fixed Capital of Machinery & Equipment	Price Inflators
1	2	3	4
1. Andhra	0.3089	0.6911	1.4949
2. Assam	0.4916	0.5084	1.5228
3. Bihar	0.1380	0.8620	1.4688
4. Gujarat	0.2984	0.7016	1.4933
5. Karnataka	0.2693	0.7307	1.4888
6. Kerala	0.3715	0.6285	1.5044
7. M.P.	0.3683	0.6317	1.5039
8. Maharashtra	0.3324	0.6676	1.4985
9. Orissa	0.2682	0.7318	1.4887
10. Punjab*	0.2698	0.7302	1.4889
11. Rajasthan	0.3465	0.6535	1.5006
12. Tamil Nadu	0.3076	0.6924	1.4947
13. U.P.	0.3030	0.6970	1.4940
14. W.Bengal	0.3373	0.6627	1.4992

* Including Haryana

Source: See the text.

Appendix Table 5A.7

Price Indexes for Construction and Machinary

(All India)

Year	Building & Construction	Machinery & Equipment
1	2	3
1960-61	100.00	100.00
1961-62	105.19	102.48
1962-63	109.17	105.18
1963-64	111.52	113.60
1964-65	116.74	114.94
1965-66	125.47	122.04
1966-67	134.47	142.20
1967-68	142.22	146.30
1968-69	151.22	147.39
1969-70	161.87	147.85
1970-71	172.32	159.77

Source : National Accounts Statistics, Feb.1976 (CSO)

Appendix Table 5A.8

Price Deflators for Fixed Capital Formation in the Manufacturing Sector (1960-61=100)

States	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
1. Andhra	1.0332	1.0641	1.1296	1.1550	1.2310	1.3981	1.4504	1.4857	1.5218	1.6365
2. Assam	1.0381	1.0714	1.1258	1.1582	1.2373	1.3840	1.4429	1.4927	1.5474	1.6594
3. Bihar	1.0285	1.0573	1.1331	1.1519	1.2251	1.4113	1.4574	1.4792	1.4978	1.6150
4. Gujarat	1.0329	1.0637	1.1298	1.1548	1.2306	1.3989	1.4508	1.4853	1.5203	1.6351
5. Karnataka	1.0321	1.0625	1.1304	1.1542	1.2296	1.4012	1.4520	1.4842	1.5163	1.6315
6. Kerala	1.0349	1.0666	1.1283	1.1561	1.2331	1.3933	1.4478	1.4881	1.5306	1.6443
7. M.P.	1.0348	1.0665	1.1283	1.1560	1.2330	1.3935	1.4480	1.4880	1.5301	1.6439
8. Maharashtra	1.0338	1.0651	1.1291	1.1554	1.2318	1.3963	1.4494	1.4866	1.5251	1.6394
9. Orissa	1.0321	1.0625	1.1304	1.1542	1.2296	1.4013	1.4521	1.4842	1.5161	1.6314
10. Punjab*	1.0321	1.0626	1.1304	1.1543	1.2297	1.4011	1.4520	1.4842	1.5163	1.6316
11. Rajasthan	1.0342	1.0656	1.1288	1.1556	1.2323	1.3952	1.4489	1.4872	1.5271	1.6412
12. Tamil Nadu	1.0331	1.0641	1.1296	1.1549	1.2310	1.3982	1.4504	1.4857	1.5216	1.6363
13. U.P.	1.0330	1.0639	1.1297	1.1549	1.2308	1.3986	1.4506	1.4855	1.5210	1.6357
14. W.Bengal	1.0339	1.0653	1.1290	1.1555	1.2320	1.3959	1.4492	1.4868	1.5258	1.6400

* Including Haryana.

Source : see the text.

Appendix Table 5A.9

Composition of Fixed Capital and Price Inflators for Electricity, Gas and Water Supply

States	Share in Fixed Capital of Structures & Construction	Share in Fixed Capital of Machinery & Equipment	Price Inflator
1	2	3	4
1. Andhra	0.1702	0.8298	1.4737
2. Assam	0.1262	0.8738	1.4670
3. Bihar	0.1184	0.8816	1.4658
4. Gujarat	0.2557	0.7443	1.4867
5. Karnataka	0.7165	0.2835	1.5571
6. Kerala	0.1151	0.8849	1.4653
7. M.P.	0.1453	0.8547	1.4699
8. Maharashtra	0.1566	0.8434	1.4716
9. Orissa	0.1151	0.8849	1.4653
10. Punjab*	0.1773	0.8227	1.4748
11. Rajasthan	0.0600	0.9400	1.4569
12. Tamil Nadu	0.1151	0.8849	1.4653
13. U.P.	0.3005	0.6995	1.4936
14. W.Bengal	0.2335	0.7665	1.4834

* Including Haryana

Source : See the text.

Appendix Table 5A.10

Price Deflators for Fixed Capital Formation in the Electricity, Gas & Water Supply

(1960-61=100)

States	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
1. Andhra	1.0294	1.0586	1.1325	1.1525	1.2262	1.4088	1.4561	1.4804	1.5024	1.6191
2. Assam	1.0282	1.0568	1.1334	1.1517	1.2247	1.4122	1.4579	1.4787	1.4962	1.6135
3. Bihar	1.0280	1.0565	1.1335	1.1515	1.2245	1.4128	1.4582	1.4784	1.4951	1.6126
4. Gujarat	1.0317	1.0620	1.1307	1.1540	1.2292	1.4022	1.4526	1.4837	1.5143	1.6298
5. Karnataka	1.0442	1.0804	1.1211	1.1623	1.2450	1.3666	1.4338	1.5013	1.5790	1.6876
6. Kerala	1.0279	1.0564	1.1336	1.1515	1.2243	1.4131	1.4583	1.4783	1.4946	1.6121
7. M.P.	1.0287	1.0576	1.1330	1.1520	1.2254	1.4108	1.4571	1.4795	1.4989	1.6159
8. Maharashtra	1.0290	1.0580	1.1327	1.1522	1.2258	1.4099	1.4566	1.4799	1.5005	1.6174
9. Orissa	1.0279	1.0564	1.1336	1.1515	1.2243	1.4131	1.4583	1.4783	1.4946	1.6121
10. Punjab*	1.0296	1.0589	1.1323	1.1526	1.2265	1.4083	1.4558	1.4807	1.5034	1.6200
11. Rajasthan	1.0264	1.0542	1.1348	1.1505	1.2225	1.4174	1.4606	1.4762	1.4869	1.6052
12. Tamil Nadu	1.0279	1.0564	1.1336	1.1515	1.2243	1.4131	1.4583	1.4783	1.4946	1.6121
13. U.P.	1.0329	1.0638	1.1297	1.1548	1.2307	1.3988	1.4507	1.4854	1.5206	1.6354
14. W.Bengal	1.0311	1.0611	1.1311	1.1536	1.2284	1.4040	1.4535	1.4828	1.5112	1.6270

* Including Haryana.

Source : see the text.

Appendix
Table 5A.11

Estimated Capital-Output Ratios For Registered Manufacturing, Un-Registered Manufacturing and Electricity, Gas and Water Supply for 1960-61 & 1970-71

States	Registered Manufacturing		Unregistered Manufacturing		Electricity, Gas & Water Supply	
	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	2	3	4	5	6	7
1. Andhra	3.7228	4.5167	1.8866	2.0879	17.8667	14.1801
2. Assam	3.4527	4.3255	4.1129	4.5239	21.0000	36.7318
3. Bihar	5.4623	6.4188	2.3015	3.7146	11.4186	39.8024
4. Gujarat	2.1570	3.2833	2.6432	1.7562	7.9064	11.5017
5. Karnataka	2.9432	2.2206	1.8634	1.5745	73.7500	5.2272
6. Kerala	2.3770	2.5853	1.9236	1.6817	15.3846	10.8273
7. M.P.	2.9190	7.0803	3.2846	2.1294	19.9266	12.3171
8. Maharashtra	2.2707	2.7542	2.3034	2.7029	11.7826	14.1653
9. Orissa	5.5609	10.6734	3.7443	3.0562	37.3667	66.6763
10. Punjab*	2.4313	2.6183	1.4917	1.5578	12.7143	17.8856
11. Rajasthan	3.6757	4.4721	4.1645	2.7228	11.4375	36.2911
12. Tamil Nadu	2.1845	3.3369	1.7727	2.1211	8.5385	9.4212
13. U.P.	2.8109	4.0306	3.2081	2.7762	9.8215	30.4767
14. W.Bengal	2.7278	3.7829	2.7496	0.9585	9.8659	19.5826

* Includes Haryana.

Source : see the text.

Appendix Table 5A.12

Estimates of Capital-Output Ratio in Selected Sectors* (All India)

Sectors	1960-61	1970-71
1. Mining & Quarrying	1.35	2.03
2. Railways	8.73	11.89
3. Transport by other Means	6.51	6.26
4. Communication	2.72	4.22
5. Trade, hotels & restaurants	1.42	1.18
6. Banking & Insurance	1.08	1.32
7. Other services	0.36	1.27
8. Forestry & Fishery	0.97	0.97
9. Construction	0.29	0.29
10. Unregistered Manufacturing	2.36	2.09

* Estimates are based on the figures of Capital Stock and output valued at 1960-61 prices.

Source : (i) Uma Datta Roy Chaudhury & V.V. Divetia: "Measurement of Distributions of Capital Stock in India" presented at Fourteenth General Conference of the International Association for Research in Income & Wealth held at Aulanko, Finland during August, 1975; (mimeo.)

(ii) Dr. Bakul H. Dholakia: The Sources of Economic Growth in India, op.cit. ch.five.

Appendix Table5A.13

Estimates of Net Capital Stock at 1960-61 Prices

(Rs. in lakhs)

Sectors	Andhra Pradesh		Assam		Bihar	
	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	2	3	4	5	6	7
1. Agriculture	101890	112264	26205	27359	82767	91458
2. Forestry & Fishing	1677	2373	1497	3125	1592	2207
3. Mining & Quarrying	853	2438	481	4135	6048	13668
4. Registered Manufacturing	11831	30149	5065	15914	37646	44052
5. Unregistered Manufacturing	10867	18392	6762	9649	7056	28543
6. Construction	1466	1720	684	1194	1846	2443
7. Electricity,Gas & Water supply	9130	18562	294	3710	982	19225
8. Railways	15504	39142	5578	13888	36003	66953
9. Communication	762	3524	547	1861	802	2490
10. Transport by other Means	18371	26711	3939	4858	7916	10667
11. Trade,Storage,Hotels & Restaurants	19613	22289	5078	4899	11770	10412
12. Banking & Insurance	816	2016	355	1002	1527	1595
13. ResidentialDwellings	77866	70912	17134	21921	72234	111940
14. Other Services	2450	12950	740	3653	2593	11994

(contd)

Appendix Table 5A.13 (contd.)

Sectors	Gujarat		Haryana		Karnataka	
	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	8	9	10	11	12	13
1. Agriculture	48676	72166	38003	51316	47283	62053
2. Forestry & Fishing	657	784	94	122	1844	3526
3. Mining & Quarrying	189	4399	38	99	1245	2322
4. Registered Manufacturing	22502	38667	2110	10709	14984	25546
5. Unregistered Manufacturing	16084	13019	3326	5755	6637	13432
6. Construction	1440	2053	408	614	880	2583
7. Electricity, Gas & Water Supply	3582	18299	1818	8782	2065	13946
8. Railways	17172	27906	1798	4958	5116	12651
9. Communication	718	3422	310	1380	685	2962
10. Transport by Other Means	4642	9008	6731	9784	11269	25422
11. Trade, Storage, Hotels & Restaurants	15315	18779	4081	5879	13054	21051
12. Banking & Insurance	1085	2841	168	503	836	3351
13. Residential Dwellings	59935	79232	26333	25598	58086	88324
14. Other Services	1894	8459	445	2424	1729	13105

(Contd.)

Appendix Table 5A.13 (contd.)

Sectors	Kerala		Madhya Pradesh		Maharashtra	
	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	14	15	16	17	18	19
1. Agriculture	18065	24269	67048	83418	66142	79876
2. Forestry & Fishing	1016	1780	3390	6765	1807	2199
3. Mining & Quarrying	347	183	2039	6405	498	1295
4. Registered Manufacturing	6361	18640	7464	42694	55278	123989
5. Unregistered Manufacturing	3973	5217	24575	20738	15265	21685
6. Construction	625	1035	1082	1582	2660	3504
7. Electricity, Gas & Water supply	3369	5240	5002	14744	9344	32240
8. Railways	2567	4804	23894	45432	22908	41960
9. Communication	419	1680	900	2595	3063	13128
10. Transport by Other Means	14459	24245	5547	7900	22850	52734
11. Trade, Storage, Hotels & Restaurants	8230	10598	8534	9814	33526	30549
12. Banking & Insurance	442	1304	630	1533	5599	14888
13. Residential Dwellings	33357	56854	58227	79082	86956	132138
14. Other Services	1358	8260	1709	8252	2377	12033

(Contd.)

Appendix Table 5A.13 (contd.)

Sectors	Orissa		Punjab		Rajasthan	
	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	20	21	22	23	24	25
1. Agriculture	38425	43764	64298	93147	77366	92420
2. Forestry & Fishing	1154	2907	84	154	485	796
3. Mining & Quarrying	980	2351	3	87	614	1242
4. Registered Manufacturing	3731	23151	4493	7410	3819	11766
5. Unregistered Manufacturing	9507	11614	3271	6127	21542	12892
6. Construction	507	586	1502	1886	974	1036
7. Electricity,Gas & Water Supply	1158	13669	4526	15149	961	12266
8. Railways	4819	10499	3710	9155	12397	23875
9. Communication	234	886	729	2870	568	1912
10. Transport by Other Means	2077	5114	9492	18911	5690	5991
11. Trade,Storage,Hotels & Restaurants	3023	3824	5397	6580	8019	12394
12. Banking & Insurance	171	574	527	1224	476	1071
13. Residential Dwellings	28025	25944	45591	44449	45301	52839
14. Other Services	1498	7135	723	3520	1112	5503

(Contd.)

Appendix Table 5A.13 (concl.)

Sectors	Tamil Nadu		Uttar Pradesh		West Bengal	
	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	26	27	28	29	30	31
1. Agriculture	84329	89693	200092	268126	52646	61832
2. Forestry & Fishing	1155	2200	2344	3434	2500	3008
3. Mining & Quarrying	157	1931	215	493	3702	6258
4. Registered Manufacturing	19744	54445	16225	42083	50074	93211
5. Unregistered Manufacturing	13575	24318	33258	39808	27040	14153
6. Construction	1192	2008	2120	2547	3806	5185
7. Electricity,Gas & Water Supply	8778	22470	8338	50713	13595	39772
8. Railways	10834	25266	30677	53184	29708	76405
9. Communication	1510	6651	1629	4406	4298	6676
10. Transport by Other Means	13736	27500	20038	29203	41736	50437
11. Trade,Storage,Hotels & Restaurants	23903	25677	24661	28266	35802	33302
12. Banking & Insurance	1632	3527	1125	2929	2496	9929
13. Residential Dwellings	82377	82077	168933	230436	74586	111605
14. Other Services	4067	18057	4298	17290	4220	19199

Source : see the text.