

Growth of Factor Inputs and Total Factor Productivity in Indian Public Sector Enterprises*

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The public sector undertakings in India have come under heavy criticism for inefficient management and low profitability. In view of the importance these undertakings command in the Indian economy, the author has done a detailed study of the productivity and efficiency of factors of production, and has concluded that the undertakings have, on the whole, performed better than the economy.

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Over the last two decades the public sector has emerged as a crucial factor in India's economic growth. In terms of expansion, the private sector has lagged behind the public sector with the result that the share of the latter sector in significant macro-economic aggregates such as gross domestic product, gross capital formation, and employment in the organized sector has been on the ascent. Furthermore, from the rate at which these aggregates have been rising it is clear that an increasing amount of scarce national resources will continue to flow to the fast expanding public sector in the years to come. At this stage, it is worthwhile asking searching questions about the productivity and efficiency of factors of production employed in the public sector enterprises to obtain an idea about productivity changes in the public sector enterprises vis-a-vis those observed for the economy.

A detailed study of the growth of total factor productivity in the public sector enterprises is both necessary and rewarding because it indicates broadly the trends in the overall economic efficiency and the extent of technical change. The need for such a study is perhaps more urgent now than ever before in view of the growing criticism of the management of the public sector enterprises mainly on account of low profitability as borne out by several studies. Basically, the

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rationale of the approach adopted by the present study lies in the contention that the index of total factor productivity is a major alternative indicator of the efficiency of economic units over time, the net profitability being the other main indicator. The index of total factor productivity, also referred to as the index of output per unit of total factor input, is derived as a ratio of the index of net output (i.e., total value added at constant prices) to the index of total factor input. The former indicates the actual growth of net output while the latter indicates the extent of growth that would have occurred had the overall productivity or the efficiency of all factors of production remained constant during the period under consideration. Hence, if we find that the index of total factor input for, say, the terminal year of the period under consideration is less than the index of net output, it implies that the observed growth of output exceeds the amount of growth that would have resulted under conditions of unchanging efficiency of factor inputs and indicates that the overall efficiency of all factor inputs taken together has increased during the period. The index of total factor productivity helps in measuring in precise quantitative terms the extent of increase in the overall efficiency (or productivity) of factor inputs.

While the net profitability criterion has been widely used in most discussions on the efficiency of public enterprises, little attention seems to have been paid to the index of total factor productivity which is obviously a more comprehensive index of economic efficiency. One can always argue, for instance, that the total benefit to the economy as a whole accruing from any production process should be measured in terms of the sum of four types of related incomes generated out of it, viz., rent, wages and salaries, interest, and profit. The conventional net profitability criterion usually focuses attention only on profit, ignoring the larger gains to the society as a whole. In other words, it can be argued that

from a wider perspective, the performance of an enterprise should be judged not by what the enterprise earns in the form of net profits but rather by the total addition it makes to the flow of goods and services in the economy as a whole and the changing efficiency with which it utilizes the scarce productive resources over a period of time.

It would be interesting to see whether the public sector enterprises pass satisfactorily the efficiency test on productivity criterion at least in terms of the observed rate of productivity change and contribution to the growth of real product over time. We have, therefore, estimated the contributions made by various sources to the estimated growth rate of real net product originating in the public sector enterprises by constructing the required time series of labour and capital inputs and deriving therefrom the indexes of total factor input and output per unit of total factor input for the period 1960-61 to 1972-73.

The broad methodology adopted for analysing the major sources of growth of the public sector enterprises is based primarily on the well-known factor share approach which has been widely used in economic literature, especially on the quantitative analysis of economic growth (Dholakia, 1974; Denison, 1967). This method, which follows directly from the marginal productivity analysis, provides a fairly satisfactory set of estimates of contributions made by various factors to the measured growth rate if the average earnings of various factors of production are proportional to the value of their respective marginal products. In particular, under the special case of a constant return competitive equilibrium, this method simply reduces to the direct use of the well-known neo-classical distribution postulate which equates the relative share of a factor to the elasticity of output with respect to that factor at the point of equilibrium (Dholakia, p. 7).

The term public sector, as it is generally defined, includes administrative departments, departmental enterprises, and non-departmental enterprises. Of these, administrative departments consist largely of those which provide direct government services in the form of public administration, defence, and other services. Departmental enterprises are those which are owned and managed directly by the government and whose accounts form part of the respective ministries. The term includes railways, communication, forests, operation of irrigation systems, road transport, electricity, manufacturing establishments, port trusts, printing presses, etc, whereas non-departmental enterprises are all government owned public and private limited companies and statutory corporations. Departmental and non-departmental enterprises taken together are referred to as the public sector enterprises. The present analysis excludes administrative departments.

The major source of data on output from the public sector enterprises is *National Accounts Statistics* (CSO, 1975). It provides detailed information on the net domestic product from the public sector enterprises by industry of origin for the period 1960-61 to 1972-73. However, these estimates are given only at current prices. We have, therefore, derived the corresponding estimates at constant 1960-61 prices by applying the appropriate implicit national income price deflators obtained from the estimates of net domestic product at current and constant 1960-61 prices for each of the fourteen different sectors distinguished in the national income accounts. The estimates of real net product originating in the public sector enterprises, so derived, are presented in Table 1, while the estimates of factor shares in the corresponding net product at current prices are presented in Table 2. It can be seen from Table 1 that the net domestic product originating in the public sector enterprises has

increased at a very rapid rate during the period 1960-61 to 1972-73:77 per cent for departmental enterprises, as high as 476 per cent for non-departmental enterprises, and 173 percent for both taken together. This implies that, during the period under consideration, the average rate of growth of net product originating in the public sector enterprises was as high as 8.73 per cent per annum, which is more than two and a half times the corresponding growth rate of India's national income, viz., 3.14 per cent per annum. As a direct consequence of this disparity in the growth rates of the net product from the public sector enterprises and the net domestic product (both at 1960-61 prices), the share of the former in the latter has increased sharply from 5.1 per cent in 1960-61 to 8.5 per cent in 1972-73. Rapid growth of net income, however, seems to have been quite neutral to the distribution of total income originating in the public sector enterprises between labour and capital (including other factors). This is evident from Table 2. We thus find that the relative shares of labour and capital have on an average remained fairly stable during the period as a whole, the average value of, say, the labour share being 61.8 per cent for the first half of the period, 62.4 per cent for the second half of the period, and 62.1 per cent for the entire period.

III

Having examined the time series of net product and factor shares, the next series that we have to derive for the present analysis is the time series of real capital stock in the public sector enterprises. Since no such series is readily available, we have derived it by using the perpetual inventory method (Goldsmith, 1951 ; Barna, 1959; Dholakia, 1974). The variant of this method that we have used here consists in obtaining a benchmark estimate of net capital stock at base period prices and carrying it forward (or backward) with the help of the estimated capital formation, adjusted for depreciation valued

at the same base period prices.

The most comprehensive source of information for obtaining benchmark estimates of the net capital stock in the public sector enterprises is the RBI's estimate of net reproducible capital stock at current prices by industry of use for 1960-61.¹ We have obtained the estimates of net capital stock at current prices for the benchmark year 1960-61 for departmental and non-departmental enterprises separately from the RBI estimates after making necessary adjustments.² CSO (1975) gives the estimates of gross capital formation by the type of assets in departmental and non-departmental enterprises along with the corresponding estimates of total depreciation allowance for the period 1960-61 to 1972-73. These estimates, however, are available only at current prices. We have, therefore, derived the corresponding estimates at constant 1960-61 prices by applying suitable price indexes for different types of assets. We have then obtained the required time series of real

1. "Estimates of Tangible Wealth in India", *Reserve Bank of India Bulletin*, October 1972, pp. 1718-48.
2. The RBI study gives the estimate of net capital stock in the public sector as a whole for the benchmark year 1960-61, valued at current prices. By deducting the corresponding capital stock in government administration and roads and bridges from this figure, we have derived the estimate of net capital stock in the public sector enterprises. This total (Rs. 5825 crore) is then decomposed into the estimated net capital stock in the departmental enterprises (Rs. 1303 crore) by preparing detailed industry-wise estimates of net capital stock for both types of enterprises. Since direct estimates could not be obtained separately for departmental and non-departmental enterprises in respect of three industrial categories, viz., manufacturing, electricity, and transport by other means, we have distributed the total estimated capital stock in the public sector enterprises for each of these three categories between the two types of enterprises in proportion to the corresponding net income originating therefrom. The separate estimates for each of the various industrial categories are then aggregated to arrive at the respective totals for departmental and non-departmental enterprises.

capital stock in the public sector enterprises by using the identity

$$K_t = A_t + GCF_t - D_t$$

where K_t and K_{t-1} are the net stocks of capital at 1960-61 prices in the period t and $t-1$ respectively, GCF_t is the estimated gross capital formation at 1960-61 prices during the period t , and D_t is the estimated depreciation allowance at 1960-61 prices during the period t . The derived estimates are presented in Table 3. A close study of this table reveals that the real stock of capital has grown at a phenomenal rate especially in the case of non-departmental enterprises. The average rate of growth of the total capital stock in the public sector enterprises during the period 1960-61 to 1972-73 turns out to be as high as 10 per cent per annum. There is a significant divergence, however, between the average growth rate of real capital stock in departmental and non-departmental enterprises, the former being 7.1 per cent per annum while the latter being as high as 16.2 per cent per annum. As a direct consequence of the disparity in growth rates of real capital stock, the share of non-departmental enterprises in the total capital stock of the public sector enterprises has increased sharply from 22 per cent in 1960-61 to 43 per cent in 1972-73.

IV

To complete the picture, we require the time series of employment in the public sector enterprises. The information on employment in the public sector as a whole is readily available from various publications of the Labour Bureau. By adjusting these figures for the employment in government administrative departments, we have obtained the time series of employment in the public sector enterprises. In addition to this, we have also worked out the series of average annual wage rate in the public enterprises implicit

in the estimates of total employee compensation (given in Table 2) and total employment in the public sector enterprises by computing the ratio of the former to the latter. Both these series, along with their respective indexes, are presented in Table 4.

It can be seen from Table 4 that the public sector enterprises have generated considerable additional employment during the period under consideration, the number of workers employed in the public sector undertakings having increased by about 76 per cent over the twelve-year period. Furthermore, the implicit average annual earnings per worker at current prices also show a remarkable increase, having increased three fold in just twelve years. If we deflate the money value of average earnings for 1972-73 by the corresponding wholesale price index, we get a figure of Rs. 1769 at 1960-61 prices, which indicates an increase of 36 per cent in real earnings per worker when compared to the figure of Rs. 1303 for 1960-61. Thus, both employment and real earnings per worker employed have, on the whole, significantly increased in the public sector enterprises during the period under consideration.

The estimates given in Tables 1,3, and 4 reveal that there exists considerable disparity among the observed rates of growth of output, employment, and real capital stock in the public enterprises. The average growth rate observed during the period 1960-61 to 1972-73 turns out to be 8.73 per cent per annum for output, 4.82 per cent per annum for employment, and 9.97 per cent per annum for net stock of real capital. These figures indicate, among other things, that some of the important ratios such as labour productivity, capital intensity, and capital-output seem to have registered an upward trend. How steady and smooth have been the trends in each of these ratios can, however, be determined only after examining the complete time series of each of these ratios. These are given (all at constant 1960-61 prices) in

Table 5. It is evident that the time series of labour productivity and capital intensity show a fairly smooth and continuous upward trend, the observed annual changes being positive in almost every year in both series. Moreover, the overall upward trend seems to be more pronounced in the case of capital intensity compared to labour productivity, the average growth rate for the former being 4.92 per cent per annum against 3.73 per cent per annum for the latter during the period as a whole.

It is the time series of capital-output ratio, however, which reveals a more interesting pattern of behaviour. An overall view of the period reveals that the capital-output ratio has shown an upward trend. But a closer look at the series reveals two clearly separable sub-periods which show exactly opposite tendencies in the ratio. We thus find that during the first part of the period, i.e., 1960-61 to 1967-68, the capital-output ratio shows a fairly continuous and rapidly rising trend, its value rising from 8.48 to 10.65. During the remaining part of the period, i.e., 1967-68 to 1972-73, the ratio has shown a fairly clear and marked tendency to decline (from 10.65 to 9.72). Besides the unambiguous and distinctly noticeable reversal of trend during 1967-68, the other point, which is perhaps equally noteworthy, is the remarkable continuity and smoothness of the upward trend before, and the downward trend after, the point of reversal.

The main reason behind this pattern of behaviour of capital-output ratio lies in the divergence between the temporal pattern of growth of labour productivity on the one hand, and of capital intensity on the other. While the growth of labour productivity seems to have been fairly uniform and evenly spread over the entire period, the growth of capital intensity reveals a highly uneven distribution over time with almost 85 per cent of the total growth having occurred during the first part of the period. This is reflected in the patterns of average growth rates which

reveal that while the growth rate of labour productivity remained more or less constant being 3.7 per cent during the first part (1960-61 to 1967-68) and 3.8 per cent per annum during the second part (1967-68 to 1972-73), the growth rate of capital intensity declined steeply from 7.1 per cent per annum during the first part to 1.9 per cent per annum during the second part of the period. The sharp decline in the growth rate of capital intensity in a period of fairly steady growth of labour productivity, therefore, appears to have been instrumental in bringing about a reversal in the upward trend in capital-output ratio in the first part of the period.

A number of factors can be considered as possible explanations of the observed decline in the growth rate of capital intensity and, without these factors, the observed stability of the growth rate of labour productivity in the public sector enterprises. The foremost among these would be the considerable decline in the absolute level of real capital formation in the public sector enterprises during the period 1968-69 to 1970-71 compared to the preceding triennium 1965-66 to 1967-68. A rapidly growing capital stock requires a progressively increasing level of real capital formation. Obviously, a declining level of real capital formation would immediately lead to a considerable deceleration in the growth of real capital stock. The observed decline in the level of real capital formation in the public sector enterprises can, to some extent, be attributed to the adverse investment climate following the industrial recession. This contention is very well supported by the sharply declining level of real capital formation (at 1969-61 prices) in non-departmental manufacturing enterprises from about Rs. 800 crore during the triennium 1965-66 - 1967-68 to about Rs. 500 crore during the following triennium 1968-69-1970-71. Although the level of real net capital formation shows a rising trend in subsequent years, it has still not risen significantly above

the peak levels reached before 1968-69.

The above explanation, however, represents only one side of the story. The other, and perhaps more interesting, side of the story is that notwithstanding the significant deceleration in the growth of capital per worker, the output per worker kept increasing at a fairly rapid rate during the period following 1967-68. We have found earlier that during the period 1967-68 to 1972-73, the average productivity of labour has been rising while the capital-output ratio has been declining. Putting this in a slightly different way, we may say that the average productivities of both labour and capital have been rising simultaneously since 1967-68. A simultaneous increase in labour productivity and capital productivity is, by any criterion, a fairly clear indicator of the phenomenon of "technical progress" defined loosely to include all possible effects which raise the overall sector economic efficiency of the entire production process. We may, therefore, conclude that significant technical progress seems to have occurred during the process of growth of the public sector enterprises, especially during the period 1967-68 to 1972-73, leading to a considerable improvement in the overall economic efficiency of all public sector enterprises. This broad contention, however, needs to be supported by precise, quantitative measures of the rate of improvement in the overall economic efficiency of the public sector enterprises during the period under consideration.

Quantitative assessment of the extent of increase in overall efficiency can be made by constructing the indexes of total factor input and output per unit of total factor input, and by estimating the contributions made by each of the major factors to the observed growth rate of output. This is done step by step in Tables 6 to 8. Table 6 presents the indexes of output and

factor inputs, and also the indexes of total factor input and output per unit of total factor input³ while Table 7 shows the estimated average annual growth rates of output factor inputs, and total factor productivity in the public sector enterprises. Finally, in Table 8, we have presented our estimates of the contributions made by major sources to the growth rate of the public sector enterprises in India. The methodology of deriving the contributions and indexes has been described by Dholakia (1974).

The estimates presented in these tables strongly support the contention that the overall economic efficiency of the public sector enterprises has increased at a significant rate in recent years. Thus, according to our estimates, the total factor productivity increased by 22.4 per cent during the period 1960-61, to 1972-73, indicating a highly significant rate of growth of 1.7 per cent per annum. While this figure in itself appears to be fairly high for the annual growth rate of overall efficiency, it is noteworthy that such a remarkable increase in total factor productivity occurred during the period of rapid expansion

3. The index of total factor input is derived as a weighted average of the index of labour input and the index of capital input, the weights being the respective relative factor shares of labour and capital. In the derivation of the index of total factor input, the weights have, however, been changed at the end of each period of five years. Thus the procedure actually followed is to change the weights each five years with each of the input index taken as 100 each fifth year, and then link the resulting quinquennial series together to arrive at the continuous series of the index of total factor input. This procedure is adopted to eliminate as far as possible the effect of short-term cyclical fluctuations in income shares on the weights to be used and at the same time confine the restrictive assumptions of the factor share approach only to the range of factor proportions derived during each time period. The index of output per unit of total factor input is derived simply by dividing the index of output by the index of total factor input.

of factor inputs in the public sector enterprises. The estimates given in Table 7 show that capital input increased at an average rate of 10 per cent per annum during the period under consideration, the corresponding figure for labour input being 4.8 per cent per annum. Consequently, the average rate of growth of total factor input during the twelve-year period was as high as 6.9 per cent per annum. These estimates imply that capital growth accounted for about 45 per cent of the estimated rate of growth of net product originating in the public sector enterprises, growth of labour accounted for 35 per cent, the remaining 20 per cent being the contribution of the growth of total factor productivity.

It is interesting to examine the temporal pattern of growth of factor inputs and total factor productivity. The results for the two sub-periods, i.e., 1960-61 to 1967-68 and 1967-68 to 1972-73, are given in Tables 7 and 8.⁴ Table 7 reveals that the growth rate of capital declined sharply from 12.05 per cent during the period 1960-61-1967-68 to 7.13 per cent during the period 1967-68-1972-73, while the corresponding growth rate of labour increased from 4.64 per cent to 5.06 per cent. However, since the decline in the growth rate of capital was quite substantial in relation to the small increase in the growth rate of labour, the average rate of growth of total factor input declined from 7.61 per cent to 5.94 per cent over the two sub-periods.

The direct effect of this kind of temporal pattern of behaviour of factor inputs would be that, if the growth rate of total factor productivity remains unchanged, the growth rate of net product would decline over the two sub-periods. However, the growth rate of net product in fact shows an increase from 8.46 per cent to 9.10 per cent on account of a sharp increase

4. The year 1967-68 has been selected for breaking the period into two sub-periods, because, as already noted, this year marks the turning point in the behaviour of capital-output ratio.

in the growth rate of total factor productivity from 0.79 per cent to 2.98 per cent over the two sub-periods. Thus, it seems that the observed increase in the growth rate of net product originating in the public enterprises is due almost exclusively to the significant increase in the growth rate of total factor productivity in the public sector enterprises recorded during the period 1967-68 to 1972-73 compared to the earlier period 1960-61 to 1967-68.

The trends in the growth rates of factor input and output noted above have interesting implications for the analysis of the contributions made by various sources to the growth rate of net product originating in the public sector enterprises. We find that the relative importance of two major sources of growth, viz, capital and total factor productivity, has undergone a considerable change between the two sub-periods. The relative contribution of capital to the growth rate of net product has declined steeply from 55.6 per cent to 30.6 per cent while relative contribution of the growth of total factor productivity has increased sharply from 9.4 per cent to 33.4 per cent over the two sub-periods.

It is indeed remarkable that the contribution made by the increase in total factor productivity to the growth rate of net product from the public sector enterprises, measured in absolute terms, increased from 0.79 per cent recorded for the first sub-period to as high as about 2.98 per cent recorded for the second sub-period. Among the variety of factors which might have been at work in bringing about such a remarkable increase, special mention may be made of two broad categories of factors. The first category of factors would obviously include improvement in the capacity utilization rates in the case of enterprises already in operation and reduction in the lag between investment and flow of output achieved through a faster completion of projects under progress. In addition to these, the other factors, which are likely to have been instrumental in improving productivity

and also in reducing the capital output ratio, especially after 1967-68 are, "a much more prudent use of working capital, a monitoring of the cash flows and a tight control over inventories" in recent years (Fernandez, 1975).

The second major category of factors would include improvement in the quality of factor inputs and technical progress on a relatively greater scale during the more recent years compared to the earlier years. While it has to be admitted that the measured growth rate of total factor productivity is a sort of "catch-all" inasmuch as it includes the effects of a variety of factors, a high value of the rate of growth of total factor productivity of the order of about 3 per cent per annum is by any criterion a clear indicator of the technical progress made in production process. It seems that the rapid growth of overall efficiency of the public sector enterprises recorded in recent years is due partly to the improvement in capacity utilization rate and partly to the phenomenon of significant technical progress.

VI

Having derived the estimates of the contributions made by various sources to the growth rate of net product originating in the public sector enterprises, we may now broadly compare them with the corresponding estimates for the Indian economy as a whole made available by Dholakia (1974). It may be noted at the very outset that the latter are more detailed and comprehensive while our estimates presented above are essentially tentative in nature. However, it is possible to make some adjustments in the available estimates for the economy as a whole to make them broadly comparable to our estimates. Accordingly, the estimated long-term rate of growth of total factor productivity, defined as the residual factor including the effect of all factors other than the growth of working force and capital, turns out to be about 1.3 per cent per annum for the economy as a whole during the post-indepen-

dence period (Dholakia, 1974), while the corresponding estimate for the public sector enterprises works out to be 1.7 per cent per annum.⁵

While the difference between two figures does not appear to be substantial in absolute terms, it cannot perhaps be regarded as insignificant when considered in relative terms. However, in view of the error margin that may be attached to our estimates and also of some degree of inherent non-comparability of the two estimates, we would not like to draw any definite conclusion from the above comparison. Nevertheless, it is quite satisfying to note that the

5. The long-term rate of growth of total factor productivity is estimated in the case of the economy as a whole for the period 1954-55 to 1968-69, while in the case of public enterprises it is estimated over the period 1960-61 to 1972-73. Since the measured rate of growth of national income during the period 1960-61 to 1972-73 was much below the average rate observed during the period 1954-55 to 1968-69, it is unlikely that the former would improve in its value if we consider the more recent years while estimating it.

long-term rate of growth of the overall efficiency with which the scarce resources are being used in the public sector enterprises does not appear to be lower than the corresponding national average; it is, in fact, all the more encouraging to find that the former has shown an upward trend in recent years.

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Table 1
Net Domestic Product Originating
in the Public Sector Enterprises, 1960-61 to 1972-73
(at 1960-61 prices)

| Year | Departmental Enterprises | | Non - Departmental Enterprises | | Total Public Sector Enterprises | |
|---------|--------------------------|--------|--------------------------------|--------|---------------------------------|--------|
| | Net (Rs. crore) | Index | Net (Rs. crore) | Index | Net (Rs.) | Index |
| 1960-61 | 522 | 100.00 | 165 | 100.00 | 687 | 100.00 |
| 1961-62 | 563 | 107.85 | 195 | 118.18 | 758 | 110.34 |
| 1962-63 | 597 | 114.37 | 258 | 156.36 | 855 | 124.45 |
| 1963-64 | 653 | 125.10 | 310 | 187.88 | 963 | 140.18 |
| 1964-65 | 669 | 128.16 | 331 | 200.61 | 1000 | 145.56 |
| 1965-66 | 730 | 139.85 | 386 | 233.94 | 1116 | 162.45 |
| 1966-67 | 736 | 141.00 | 409 | 247.88 | 1145 | 166.67 |
| 1967-68 | 757 | 145.02 | 456 | 276.36 | 1213 | 176.57 |
| 1968-69 | 820 | 158.09 | 540 | 327.27 | 1360 | 197.96 |
| 1969-70 | 831 | 159.20 | 635 | 384.85 | 1466 | 213.39 |
| 1970-71 | 853 | 163.41 | 730 | 442.42 | 1583 | 230.42 |
| 1971-72 | 880 | 172.22 | 817 | 495.15 | 1716 | 249.78 |
| 1972-73 | 924 | 177.01 | 951 | 576.36 | 1875 | 272.93 |

Source: *National Accounts Statistics: 1960-61—1972-73* (New Delhi: Central Statistical Organization [CSO]). 1975.

Table 2
Factor Shares in Net Income

| Year | Absolute Factor Shares (Rs. crore at Current Prices) | | | Relative Factor Shares (per cent) | | |
|---------|---|----------|------|--------------------------------------|------------------|--------|
| | Labour | Property | Net | Labour | Share of Capital | Total |
| 1960-61 | 433 | 254 | 687 | 63.03 | 36.97 | 100.00 |
| 1961-62 | 472 | 284 | 756 | 62.88 | 37.12 | 100.00 |
| 1962-63 | 546 | 249 | 795 | 68.68 | 31.32 | 100.00 |
| 1963-64 | 605 | 465 | 1070 | 56.54 | 43.46 | 100.00 |
| 1964-65 | 714 | 459 | 1173 | 60.87 | 39.13 | 100.00 |
| 1965-66 | 833 | 543 | 1376 | 60.54 | 39.46 | 100.00 |
| 1966-67 | 945 | 577 | 1522 | 62.09 | 37.91 | 100.00 |
| 1967-68 | 1081 | 604 | 1685 | 64.15 | 35.85 | 100.00 |
| 1968-69 | 1208 | 761 | 1969 | 61.35 | 38.65 | 100.00 |
| 1969-70 | 1410 | 868 | 2278 | 61.90 | 38.10 | 100.00 |
| 1970-71 | 1651 | 995 | 2646 | 62.40 | 37.60 | 100.00 |
| 1971-72 | 1841 | 1152 | 2993 | 61.51 | 38.49 | 100.00 |
| 1972-73 | 2143 | 1249 | 3392 | 63.18 | 36.82 | 100.00 |

Source: *National Accounts Statistics: 1960-61—1972-73* (New Delhi: C.St.O. 1975).

Table 3
Growth of Real Net Capital Stock
(at 1960-61 prices)

| Year | Departmental Enterprises | | Non-Departmental Enterprises | | Total Public Sector Enterprises | |
|---------|--------------------------|-----------------|------------------------------|-----------------|---------------------------------|-----------------|
| | Net Stock (Rs. crore) | Index Number | Net Stock (Rs. crore) | Index Number | Net Stock (Rs. crore) | Index Number |
| 1960-61 | 4522 | 100.00 | 1303 | 100.00 | 5825 | 100.00 |
| 1961-62 | 4897 | 108.29 | 1642 | 126.02 | 6539 | 112.26 |
| 1962-63 | 5380 | 118.87 | 2033 | 156.02 | 7413 | 127.26 |
| 1963-64 | 5936 | 131.27 | 2513 | 192.86 | 8449 | 145.05 |
| 1964-65 | 6518 | 144.14 | 3037 | 233.08 | 9555 | 164.03 |
| 1965-66 | 7098 | 156.97 | 3695 | 283.58 | 10793 | 185.29 |
| 1966-67 | 7580 | 167.62 | 4298 | 329.85 | 11878 | 203.91 |
| 1967-68 | 8003 | 176.97 | 4918 | 377.44 | 12921 | 221.82 |
| 1968-69 | 8434 | 186.51 | 5546 | 425.63 | 13980 | 240.00 |
| 1969-70 | 8828 | 195.22 | 6131 | 470.53 | 14959 | 256.81 |
| 1970-71 | 9259 | 204.75 | 6746 | 517.73 | 16005 | 274.76 |
| 1971-72 | 9752 | 215.66 | 7382 | 566.54 | 17134 | 294.15 |
| 1972-73 | 10333 | 228.51 | 7898 | 606.14 | 18231 | 312.98 |

Source: (I) "Estimates of Tangible Wealth in India," *RBI Bulletin*, October 1972.

(II) *National Accounts Statistics: 1960-61—1972-73* (New Delhi: CSO, 1975). Also see footnote 2.

Table 4
Growth of Employment and Average Earnings of Labour

| Year | Employment | | Average Earnings at | |
|---------|---|-----------------|---|---------------------------|
| | Total No. of Persons Employed (in Thousands) | Index Number | Current Earnings Person Employed (Rupees) | Prices Index Number |
| 1960-61 | 3323 | 100.00 | 1303 | 100.00 |
| 1961-62 | 3521 | 105.96 | 1448 | 110.74 |
| 1962-63 | 3762 | 113.21 | 1451 | 111.35 |
| 1963-64 | 3992 | 120.13 | 1516 | 116.34 |
| 1964-65 | 4222 | 127.05 | 1691 | 129.77 |
| 1965-66 | 4388 | 132.05 | 1898 | 145.66 |
| 1966-67 | 4484 | 134.94 | 2107 | 161.70 |
| 1967-68 | 4566 | 137.41 | 2367 | 181.65 |
| 1968-69 | 4774 | 143.67 | 2530 | 194.16 |
| 1969-70 | 4899 | 147.43 | 2878 | 220.87 |
| 1970-71 | 5124 | 154.20 | 3222 | 247.35 |
| 1971-72 | 5423 | 163.20 | 3395 | 260.55 |
| 1972-73 | 5845 | 175.90 | 3670 | 281.65 |

Source: *Indian Labour Statistics* (various issues for the years from 1960 to 1974).

Table 5
Trends in Labour Productivity, Capital Intensity,
and Capital-Output Ratio

| Year | Average Productivity of Labour (Rupees) | Capital per Person Employed (Rupees) | Capital- Output Ratio |
|---------|--|---|-----------------------------|
| 1960-61 | 2067 | 17529 | 8.48 |
| 1961-62 | 2153 | 18571 | 8.63 |
| 1962-63 | 2273 | 19705 | 8.67 |
| 1963-64 | 2412 | 21165 | 8.77 |
| 1964-65 | 2369 | 22632 | 9.56 |
| 1965-66 | 2543 | 24597 | 9.67 |
| 1966-67 | 2554 | 26490 | 10.37 |
| 1967-68 | 2657 | 28298 | 10.65 |
| 1968-69 | 2849 | 29284 | 10.28 |
| 1969-70 | 2992 | 30535 | 10.20 |
| 1970-71 | 3089 | 31235 | 10.11 |
| 1971-72 | 3164 | 31595 | 9.98 |
| 1972-73 | 3208 | 31191 | 9.72 |

Source: Tables 1, 3, and 4.

Table 6
Indexes of Total Factor Input and Total Factor Productivity
1960-61 to 1972-73

| Year | Index of Output | Index of Capital Input | Index of Labour Input | Index of Total Factor Input | Index of Output per Unit of Total Factor Input* |
|---------|--------------------|------------------------------|-----------------------------|--------------------------------------|---|
| 1960-61 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| 1961-62 | 110.34 | 112.26 | 105.96 | 108.35 | 101.84 |
| 1962-63 | 124.45 | 127.26 | 113.21 | 118.55 | 104.98 |
| 1963-64 | 140.18 | 145.05 | 120.13 | 129.60 | 108.16 |
| 1964-65 | 145.56 | 164.03 | 127.05 | 141.10 | 103.16 |
| 1965-66 | 162.45 | 185.29 | 132.05 | 151.08 | 107.24 |
| 1966-67 | 166.67 | 203.91 | 134.94 | 159.57 | 104.45 |
| 1967-68 | 176.57 | 221.82 | 137.41 | 167.12 | 105.65 |
| 1968-69 | 197.96 | 240.00 | 143.67 | 177.37 | 111.61 |
| 1969-70 | 213.39 | 256.81 | 147.43 | 185.46 | 115.06 |
| 1970-71 | 230.42 | 274.76 | 154.20 | 195.64 | 117.78 |
| 1971-72 | 249.78 | 249.78 | 163.20 | 207.99 | 120.09 |
| 1972-73 | 272.93 | 312.98 | 175.90 | 223.05 | 122.36 |

* Index of Output per Unit of Total Input=Index of Output÷Index of
Capital Input. Source:
Tables 1 to 4.

**Average Growth Rates of Output, Factor Inputs,
and Total Factor Productivity**
(per cent)

| <i>Factor</i> | 1960-61 | 1967-68 | 1960-61 |
|--|---------------|---------------|---------------|
| | to 1967-68 | to 1972-73 | to 1972-73 |
| Labour Input | 4.64 | 5.06 | 4.82 |
| Capital Input | 12.05 | 7.13 | 9.97 |
| Total Factor Input | 7.61 | 5.94 | 6.91 |
| Output per Unit of Total Factor Input | 0.79 | 2.98 | 1.70 |
| Net Product | 0.46 | 9.10 | 8.73 |

Source: Table 6.

**Table 8 Contribution of Major
Sources to the Growth Rate of Net Product**

| <i>Source</i> | <i>Absolute Contribution (in percentage points)</i> | | | <i>Relative Contribution (in per cent)</i> | | |
|-----------------------------------|---|--------------------------|--------------------------|--|--------------------------|--------------------------|
| | 1960-61 to 1967-68 | 1967-68 to 1972-73 | 1960-61 to 1972-73 | 1960-61 to 1967-68 | 1967-68 to 1972-73 | 1960-61 to 1972-73 |
| Labour Input | 2.96 | 3.28 | 3.09 | 35.0 | 36.0 | 35.4 |
| Capital Input | 4.70 | 2.78 | 3.92 | 55.6 | 30.6 | 44.9 |
| Total Factor Input | 7.66 | 6.06 | 7.01 | 90.6 | 66.6 | 80.3 |
| Output Per Unit of Total Input | 0.80 | 3.04 | 1.72 | 9.4 | 33.4 | 19.7 |
| Growth Rate of Net Product | 8.46 | 9.10 | 8.73 | 100.0 | 100.0 | 100.0 |

Source: Tables 2 and 7.