UNIT 20 PRODUCTIVITY IN INDIAN INDUSTRIES

Structure

20.0 OBJECTIVES

In Unit 19, we have discussed the concept and measurement of productivity. This unit will deal with the empirical application of those concepts and measurement methods to Indian industry. It will also explore the influences of output growth and trade policy liberalisation on industrial productivity in India. After reading this unit, you will be able to:

- know about the trends in labour productivity, capital productivity, total factor productivity, and capital intensity in Indian industry in the last five decades;
- become aware of the large inter-industry differences in productivity growth and the causes of variation in productivity growth;
- understand the relationship between output growth and productivity growth; and
- be able to comprehend the implications of trade liberalisation for industrial productivity in India

20.1 INTRODUCTION

When India started on the path of industrialisation after Independence, the country's industrial base was small and narrow, dominated by cotton and jute textiles. India adopted an import-substitution oriented (or inward-looking) industrialisation strategy. High protection was given to domestic industry from foreign competition, through customs duties and quantitative restrictions on imports (e.g. import licensing). Also,

there was strong regulation of domestic industry through industrial licensing and other measures of industrial control to pursue the objectives of diversification, self-reliance, balanced regional development, control of monopoly, promotion of indigenous technological development, etc.

These policies helped India establish a large and well-diversified industrial sector. There was considerable development of technological capabilities in the country. However, the high level of protection and industrial regulation made Indian industry inefficient and high-cost. To improve industrial efficiency, a gradual process of trade and industrial reforms was initiated in India in the late 1970s, which gained momentum after 1985. Since 1991, a major reform of economic policies has been undertaken in India about which you must be well aware. Most regulations on industrial firms have been done away with. Imports of almost all commodities are freely allowed. Customs duties have been drastically lowered. Foreign investment is much encouraged, and this has led to a large inflow of foreign investment.

Against this backdrop, we may ask, what has been the productivity performance of Indian industry in last five decades? Was the growth rate of productivity very low in the period of high protection and strong industrial regulation? Did productivity growth accelerate in the 1980s and 1990s when significant industrial and trade reforms were undertaken? We shall be addressing these questions in this unit using productivity estimates made in some important productivity studies undertaken for Indian industry.

There have been a number of studies on productivity in Indian industry. Almost all studies have considered only the organised sector i.e. factories employing 10 or more workers with power or 20 or more workers without power. In these studies, estimates of labour productivity, capital productivity, total factor productivity and capital intensity have been presented. Labour productivity has commonly been measured by the ratio of real value added to employment (number of employees). Real value added has been obtained by suitably deflating value added at current prices so as to correct for price changes. Capital productivity has been measured by the ratio of real value added to the value of fixed capital stock at constant prices. Fixed capital stock at constant prices per employee has been used as a measure of capital intensity. For measuring total factor productivity, Kendrick, Solow and translog indices of total factor productivity have been used. In some studies, the production function approach to the estimation of total factor productivity has been taken.

Check Your Progress 1

1) Fill in the blanks:
After Independence, India adopted ..... industrialisation strategy. The level of protection of Indian industry from foreign competition was ..... . Also, there was ..... regulation of domestic industry through industrial licensing etc. All these had ..... effect on industrial productivity.

2) How have labour and capital productivity been commonly measured in productivity studies on Indian industry?

3) Mark T for true and F for false:
   i) Most productivity studies for Indian industry have considered only the organised sector. ( )
   ii) Capital intensity has commonly been measured by the ratio of employment to fixed capital. ( )
   iii) Kendrick, Solow and translog indices have been used to measure total factor productivity ( )
   iv) No productivity study on Indian industry has taken the production function approach to the measurement of total factor productivity. ( )

20.2 LABOUR PRODUCTIVITY, CAPITAL PRODUCTIVITY AND CAPITAL INTENSITY

Before we consider the trends in total factor productivity, we shall discuss the trends in labour and capital productivity, and capital intensity in Indian manufacturing.

20.2.1 Labour Productivity

In the five decades 1950s through 1990s, there has been a consistent upward trend in labour productivity in Indian manufacturing (see Table 20.1). From 1951 to 1970, the average growth rate of labour productivity was about five per cent per annum. In the next ten years (the 1970s), the average growth rate in labour productivity was much lower at about one per cent per annum. In the 1980s and 1990s, the growth rate of labour productivity picked up again. In this period, the average growth rate of labour productivity was over six per cent per annum. Evidently, there has been a rapid growth in labour productivity in Indian manufacturing in the last two decades.

Table 20.1: Growth Rates of Labour Productivity, Capital Productivity and Capital Intensity in Indian Manufacturing, 1951 to 1997-98

(per cent per annum)

Author/ Period	Growth rate in labour productivity	Growth rate in capital productivity	Growth rate in capital intensity
Goldar			
1951 to 1965	3.83	-1.14	5.38
1956 to 1970	5.56	-2.03	3.54
1970 to 1980	0.94	-0.13	0.81
Ahluwalia			
1965-66 to1979-80	1.4	-1.9	3.3
1980-81 to1985-86	8.3	0.0	8.4
Trivedi et al.			
1973-74 to1980-81	1.84	-0.83	2.67
1980-81 to1990-91	6.56	-0.82	7.38
1990-91 to1997-98	6.52	-0.56	7.08

Source: B.N. Goldar, *Productivity Growth in Indian Industry*, New Delhi: Allied Publishers, 1986; B.N. Goldar, "Productivity and Factor Use Efficiency in Indian Industry" in Arun Ghosh et al. (ed), *Indian Industrialisation: Structure and Policy Issues*, Delhi: Oxford University Press, 1992; I.J. Ahluwalia, *Productivity and Growth in Indian Manufacturing*, Delhi: Oxford University Press, 1991;

P. Trivedi, A. Prakash, and D. Sinate, "Productivity in Major Manufacturing Industries in India," Study no. 20, Development Research Group, Department of Economic Analysis and Policy, Reserve Bank of India, Mumbai, August 2000.

Note: The estimates of productivity growth made by Goldar for the periods 1956 to 1970 and 1970 to 1980 relate to the entire industrial sector including electricity. The estimates for the period 1951 to 1965 exclude electricity, but do not cover all manufacturing industries.

20.2.2 Capital Productivity

During the 1950s and 1960s, the first two decades of planned industrial development in India, capital productivity in Indian manufacturing declined significantly. The average rate of decline was about 1.5 per cent per annum. During this period, there were phenomenal changes in the structure of the industrial sector in favour of metals, machinery and chemical industries. These industries have relatively low output-capital ratio as compared to traditional industries such as textiles. Therefore, the change in industrial structure led to a fall in capital productivity. The fall in capital productivity was particularly marked in the period 1956 to 1965, the Second and Third Five-Year Plans, when the average rate of fall was about three per cent per annum.

The estimated growth rates of capital productivity shown in Table 20.1 indicate that a downward trend in capital productivity in Indian manufacturing continued in the 1970s, 1980s and 1990s. The average rate of decline in capital productivity in this period was about 0.7 per cent per annum.

20.2.3 Capital Intensity

Capital intensity in Indian manufacturing increased rapidly in the period 1951 to 1970, especially during 1956-65. The average growth rate of capital intensity was about four per cent per annum. In the next decade, i.e. the 1970s, the rate of increase in capital intensity was relatively much lower. In the 1980s, there was a sharp increase in capital intensity, and the high rate of growth continued in the 1990s. During the 1980s and 1990s, the average growth rate of capital intensity in Indian manufacturing was around seven per cent per annum.

You will notice that the ups and downs in the growth rate of capital intensity match that of labour productivity. During the 1970s, the growth rates of both labour productivity and capital intensity came down, and there was a step-up in growth rates in the 1980s. This can be explained by the fact that a large part of the increase in labour productivity was caused by factor substitution, i.e. capital substituting labour. Indeed, in the last five decades, increases in capital intensity accounted for more than half of the increases in labour productivity in Indian industry.

You may ask here: what were the reasons for the increase in capital intensity? This was partly due to changes in relative prices of labour and capital input. Since wages grew rapidly, faster than the price of capital input, industrialists had an inducement to substitute labour by capital. But, a major explanation for increasing capital intensity lies in shifts in industrial composition. In the 1950s, 1960s and 1980s, there were significant shifts in industrial composition in favour of capital-intensive industries, and this caused the capital intensity of Indian manufacturing to increase.

Check Your Progress 2

1) Fill in the blanks:

   During the 1950s and 1960s, labour productivity in Indian manufacturing grew at the average annual rate of about ..... . In the 1970s, the average growth rate was much lower at about ..... per annum. The average growth rate in labour productivity in the 1980s and 1990s was about ..... per annum.

2) Mark T for true or F for false:

   i) There was an upward trend in labour productivity in the last five decade. ( )

ii) There was a downward trend in capital productivity in the last five decades ( )

iii) In the 1980s and 1990s labour has been substituting capital in Indian industry. ( )

iv) A large part of the increase in labour productivity can be attributed to increases in capital-labour ratio in Indian industry. ( )

3) List two factors that have caused capital intensity of Indian industry to increase.

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20.3 TOTAL FACTOR PRODUCTIVITY (TFP)

We have discussed above trends in labour and capital productivity. Let us now consider trends in total factor productivity (TFP). Table 20.2 shows the estimates of TFP growth rate obtained in a number of studies undertaken for Indian industry.

20.3.1 TFP Growth during the 1950s and 1960s

During the 1950s and 1960s, the growth rate of TFP in Indian manufacturing was very low (see Table 20.2). The average rate of TFP growth in this period was less than one per cent per annum. Some studies have even reported a fall in TFP in the manufacturing sector in this period.

The poor productivity performance of Indian manufacturing in the 1950s and 1960s can be attributed to the following factors:

i) decline in competition, resulting from import control and domestic industrial licensing, protected inefficiency and blunted incentive for cost reduction;

ii) control of foreign exchange and important raw materials, and the policies aimed at control of monopoly and dispersal of ownership led to industrial fragmentation (sub-optimal production capacities), which adversely affected efficiency; and

iii) the general economic condition (shortages of materials and power, transport bottlenecks, and disturbed industrial relations) was not conducive to productivity growth.

20.3.2 TFP Growth during the 1970s and 1980s: The Controversy

Total factor productivity growth in Indian manufacturing in the 1970s and 1980s has been a matter of much controversy as may researches have found conflicting results for this period. Ahluwalia found a decline in TFP in Indian manufacturing in the period 1965-66 to 1979-80, and a sharp increase in TFP in the period 1980-81 to 1985-86 (see Table 20.2). She attributed the observed "turnaround" in productivity growth in the 1980s to liberalisation of economic policies.

Table 20.2: Total Factor Productivity Growth in Indian Manufacturing, 1951 to 1997-98

Author	Method	Period	TFP growth rate (per cent per annum)
Goldar	VASD	1951 to 1965	1.27
		1956 to 1970	0.51
		1970 to 1980	0.42
Ahluwalia	VASD	1959-60 to 1965-66	0.2
		1965-66 to 1979-80	-0.3
		1980-81 to 1985-86	3.4
Balakrishnan and Pushpangadan	VASD	1970-71 to 1980-81	-0.61
		1980-81 to 1988-89	2.39
	VADD	1970-71 to 1980-81	4.67
		1980-81 to 1988-89	-0.11
Rao	VASD	1973-74 to 1980-81	-0.2
		1981-82 to 1992-93	2.1
	VADD	1973-74 to 1980-81	4.6
		1981-82 to 1992-93	-0.2
	GOF	1973-74 to 1980-81	5.5
		1981-82 to 1992-93	-2.2
Trivedi, et al.	VASD	1973-74 to 1980-81	1.04
		1980-81 to 1990-91	3.54
		1990-91 to 1997-98	1.95
	VADD	1973-74 to 1980-81	1.99
		1980-81 to 1990-91	7.35
		1990-91 to 1997-98	3.70
	GOF	1973-74 to 1980-81	0.57
		1980-81 to 1990-91	1.64
		1990-91 to 1997-98	0.94

Source: (1)B.N. Goldar, op. cit.; (2) I.J. Ahluwalia, op. cit.; (3) P. Trivedi, et al., op. cit.; (4) P. Balakrishnan and K. Pushpangadan , "Total Factor Productivity Growth in Manufacturing Industry: A Fresh Look," *Economic and Political Weekly*, July 30, 1994; (5) J.M. Rao, "Manufacturing Productivity Growth: Method and Measurement", *Economic and Political Weekly*, November 2, 1996.

Note: VASD= single deflated value added; VA DD= double deflated value added; GOF = gross output function, i.e. based on three-input model taking labour, capital and material as inputs and gross value of production as output.

Ahluwalia's finding of a "turnaround" in productivity growth in Indian manufacturing in the 1980s has been challenged by Balakrishnan and Pushpangadan. They have seriously questioned the use of single deflation procedure for the measurement of real value added. By using double deflated value added, instead of single deflated value added, they have shown that TFP growth in Indian manufacturing in the 1980s was not any higher (rather it was lower) than that during the 1970s (see Table 20.2).

Before proceeding further, let us discuss what is double deflated value added and how it is different from single deflated value added. The single deflated value added has commonly been used in productivity studies. Under this procedure, the value-added series is directly deflated by a price index of manufactured products to obtain single deflated value added. To obtain double deflated value added, we deflate separately the value of production and the value of materials (including energy inputs). Value of production is deflated by the price index for manufactured products. Value of materials is deflated by a suitable price index for materials. Then, the real value of materials is subtracted from the real value of production to get real value added.

In the 1970s, the price index of materials grew much faster than the price index of manufactured articles. In the 1980s, it was the opposite - materials prices grew slower than product prices. Balakrishnan and Pushpangadan have argued that the use of single-deflated value added is inappropriate in such a situation, as it does not correctly measure the growth in output. Some subsequent studies have argued that both single deflated value added and double deflated value added are subject to bias and the right method to use is the gross output function, taking labour, capital and materials as three inputs and gross value of production as output.

Findings of the study undertaken by Rao, (see Table 20.2) support the findings of Balakrishnan and Pushpandagadan. These two studies show that in the 1970s there was a significant increase in TFP in Indian manufacturing and the growth of TFP came down in the 1980s. Indeed, these studies find a decline in TFP in Indian manufacturing in the 1980s.

20.3.3 Towards Resolution of the Productivity Growth Controversy

TFP estimates presented in a recent productivity study undertaken by Trivedi, Prakash and Sinate indicate that there was a significant increase in TFP in manufacturing in the 1970s, and the growth rate was faster in the 1980s (see Table 20.2). The same pattern in TFP growth is found whether single deflation procedure, double deflation procedure or gross output function is used. Some other recent research on industrial productivity has also found a significant increase in TFP in Indian manufacturing in the 1980s.

During the 1980s, particularly in the second half, steps were taken to liberalise industrial and trade policy. Policy changes were made to encourage inflow of foreign investment and technology. The industrial sector responded well these policy initiatives. One would therefore expect industrial productivity to grow significantly in the 1980s.

But, the issue is: was there acceleration in TFP growth in Indian manufacturing in the

1980s as compared to the previous decade. This remains controversial. Goldar and Mitra have raised questions about the conclusions drawn by Balakrhishnan and Pushpangandan in their study. In a recent paper (2002), Balakrishnan and Pusphangadan have presented evidence to suggest that there was no significant acceleration.

Thus, the overall conclusion we may draw from the TFP estimates made in various studies is that TFP in manufacturing grew significantly in both the 1970s and 1980s. But, it is not clear if TFP growth was faster in the later decade. Some researchers are of the view that the growth rate of TFP was higher in the 1980s, while others take the stand that there was no significant acceleration.

20.3.4 TFP Growth in the 1990s

As you know quite well, since 1991 major, far-reaching changes in industrial and trade policies have been made under the economic reforms. These policy reforms are aimed at making Indian industry more efficient, technologically up-to-date and competitive, with the expectation that efficiency improvement, technological up-gradation, and enhancement of competitiveness will enable Indian industry achieve rapid growth.

Have the economic reforms resulted in a faster growth in productivity in Indian manufacturing? The answer is no. The productivity estimates of Trivedi, Prakash and Sinate shown in Table 20.2 reveal that the growth rate of TFP in manufacturing has come down (rather than going up) in the 1990s. Some other recent studies have also found a decline in TFP growth rate in Indian manufacturing in the 1990s.

Why did TFP growth in Indian manufacturing decelerate in the 1990s when major economic reforms were undertaken? The answer is not known yet. But, it is undoubtedly an important question to be investigated. Two possible explanations for the slowdown in productivity growth are:

i) Import liberalisation may have exposed some industries to intense import competition. This may have led to under-utilisation of capacity and hence a fall in productivity.

ii) There was a spurt in investment activity in response to economic reforms. This may have caused an adverse effect on productivity due to gestation lags.

Note, however, that these are short-term effects. As Indian industries restructure to meet import competition and the second-generation economic reforms are undertaken to consolidate the gains from the first generation reforms, the productivity growth should improve.

Check Your Progress 3

1) Fill in the blanks:

During the 1950s and 1960s, the average rate of TFP growth in Indian manufacturing was very ..... (high/low). The growth rate of TFP ..... (improved/deteriorated) in the 1970s and 1980s. In the 1990s, the post reform period, the growth rate of TFP has ..... (gone up/ come down).

2) Give any two reasons for the low rate of TFP growth in Indian manufacturing in the 1950s and 1960s.

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3) Name the authors of two studies, which have reported a marked improvement in the growth rate of TFP in Indian manufacturing in the 1980s as compared with the 1970s.

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4) List two possible reasons for the slowdown in TFP growth in Indian manufacturing in the 1990s

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20.4 INTER-INDUSTRY VARIATION IN PRODUCTIVITY GROWTH

Having discussed productivity growth at the aggregate level, we now turn to industry-wise productivity growth performance. Table 20.3 shows productivity growth rates for 30 important industries in the period 1959-60 to 1985-86.

20.4.1 Differences in Productivity Growth Rates

From Table 20.3, you will notice that the rate of productivity growth varies widely across industries. During the period 1959-60 to 1985-86, the growth rate of TFP at the aggregate manufacturing level was -0.4 per cent per annum. But, in a number of industries, the rate of fall was more than two per cent per annum. These industries include Sugar, Khandsari, and Gur, Tobacco products, Non-ferrous metals, Petroleum and coal products, Tyres and tubes, Bolts, nuts, nails, and hand tools, and Dyestuffs and paints . On the other hand, in a number of industries, there was a significant increase in TFP. The growth rate of TFP exceeded two per cent per annum. These industries include Power generation equipment, Boilers and internal combustion engines, Telecommunications equipment, and Motor cycles and bicycles.

Table 20.3: Productivity Growth in Selected Manufacturing Industries, 1959-60 to 1985-86

Sr. no.	Description	Growth rate (% per annum)			
		Real value added	TFP	Labour productivity	Capital productivity
1	Cotton textiles	2.0	0.2	1.9	-3.0
2	Iron and Steel	3.4	-1.6	0.1	-2.8
3	Food products except sugar	2.7	-1.9	0.1	-2.9
4	Sugar, Khandsari, and Gur	4.0	-2.3	-2.3	-2.1
5	Pharmaceuticals	9.0	1.7	4.2	0.4
6	Heavy vehicles and motor cars	7.3	-0.9	1.3	-2.4
7	Jute textiles	0.6	0.1	0.8	-2.4
8	Paper and newsprint	5.9	-0.7	1.5	-2.0
9	Fertilisers and insecticides	13.1	1.3	6.3	-1.0
10	Railway equipment	2.9	1.3	2.6	-3.8
11	Printing and publishing	3.8	0.9	2.8	-2.1
12	Tobacco products	2.4	-3.1	-2.0	-4.0
13	Power generation equipment	10.7	4.3	6.1	2.6
14	Non-ferrous metals	0.4	-7.3	-3.0	-9.3
15	Art Silk	10.0	0.7	3.3	-0.6
16	Heavy chemicals	8.9	-1.7	1.0	-2.7
17	Petroleum and coal products	5.2	-3.7	-2.7	-4.1
18	Manmade fibres & synthetic resins	10.4	0.4	2.2	-0.3
19	Cement	5.1	-0.5	1.3	-1.4
20	General items of machinery	10.5	1.2	5.3	-2.1
21	Machinery for specific industries	5.5	-0.5	2.6	-3.7
22	Tyres and tubes	4.9	-3.8	-1.2	-5.0
23	Boilers and internal combustion engines	8.1	2.4	5.1	0.3
24	Bolts, nuts, nails, and hand tools	2.9	-2.1	0.1	-4.0
25	Dyestuffs and paints	4.7	-2.9	-0.6	-3.7
26	Telecommunications equip	10.7	3.5	5.9	0.8
27	Electric cables and wires	6.9	0.1	2.3	-1.0
28	Soaps, glycerin and perfumes	7.1	-1.2	1.7	-2.5
29	Beverages	8.8	-0.2	1.2	-0.7
30	Motor cycles and bicycles	10.1	2.1	3.8	0.5
	Total manufacturing	5.3	-0.4	2.2	-2.5

Source: I.J. Ahluwalia, *Productivity and Growth in Indian Manufacturing*, Delhi: Oxford University Press, 1991.

Similarly, there are wide inter-industry variations in the growth rates of labour productivity and capital productivity. During 1959-60 to 1985-86, the annual growth rate in labour productivity was over five per cent in Fertilisers and insecticides, Power generation equipment, General items of machinery, Boilers and internal combustion engines and Telecommunications equipment. On the other hand, labour productivity declined at a rate of more than two per cent per annum in Sugar, Khandsari, and Gur, Tobacco products, Non-ferrous metals, and Petroleum and coal products.

You will notice from Table 20.3 that the inter-industry growth pattern of TFP is similar to that of labour productivity and capital productivity. The correlation coefficient between TFP growth and labour productivity growth is 0.92. The correlation coefficient between growth rates in labour productivity and capital productivity is 0.76.

What do these high correlation coefficients mean? The industries which perform better in terms of labour productivity growth generally perform better also in terms of capital productivity growth and total factor productivity growth.

It is important to learn that questions have been raised about the TFP estimates of Ahluwalia, used in Table 20.3. These estimates are based on single-deflated value added which has well-known limitations. However, these estimates have been used for the discussion because Ahluwalia's book is well known, and there is no recently published book in which productivity growth estimates for a large number of Indian industries have been presented.

20.4.2 Relationship between Output Growth and Productivity Growth

In the literature on productivity, it is well known that there exists a strong positive relationship between output growth and productivity growth. This is known as Verdroon's law.

In a large number of studies, a strong positive relationship has been found between output growth and productivity growth. For Indian industries, a positive relationship between output growth and productivity growth has been found in the studies undertaken by Goldar and Ahluwalia. The elasticity of productivity growth with respect to output growth has been found to be about 0.4, implying that a one percentage point faster growth in output leads to about 0.4 percentage point faster growth in productivity.

Why should we expect a higher rate of output growth to be associated with a higher rate of productivity growth? The positive relationship can be attributed to technological progress and economies of scale. A higher rate of growth of production will encourage and facilitate application of superior technologies. It will create right conditions for replacement of old machinery by better ones. A rapid growth in output will enable firms to reach optimal scale of production and enjoy economies of scale. It will also encourage the suppliers of materials to undertake innovations for improving the quality of materials supplied.

If you compare the rates of output growth and TFP growth given in Table 20.3, you will find that most industries, which rank high in terms of output growth also rank high in terms of TFP growth. Similarly, low growth rate in output is associated with a low growth rate in TFP. The same pattern can be seen when labour productivity or capital productivity is considered. The correlation coefficient between output growth and TFP growth is 0.63. The correlation coefficient between output growth and labour productivity growth is 0.74 and that between output growth and capital productivity growth is 0.73

20.4.3 Causes of Inter-industry Variation in Productivity Growth

In the studies undertaken by Goldar and Ahluwalia, multiple regression analysis has been applied to explain inter-industry differences in productivity growth. These studies have brought out an inverse relationship between the degree of import substitution and productivity growth. The higher the contribution of import substitution to the growth of an industry, the lower is the rate of productivity growth, other things remaining the same.

Import substitution has two roles: market augmenting role and protective role. In its market-augmenting role, import substitution has an effect on productivity similar to that of the growth in output. But, in its protective role, import substitution is expected to have an adverse effect on productivity growth. This is so because by limiting the degree of foreign competition and sheltering domestic industry, import substitution lowers the incentive for reducing cost and improving productivity. Clearly, the results of regression analysis indicate that the negative effect of import substitution has been strong in India.

From the regression analysis of inter-industry differences in productivity growth, Ahluwalia has found a negative relationship between capital intensity of an industry and the rate of productivity growth achieved. This possibly shows the poor productivity performance of public sector industrial enterprises because the capital-intensive industries are generally dominated by public sector enterprises.

Ahluwalia has also found a negative relationship between the rate of increase in the number of factories in an industry and the rate of productivity growth achieved. This can be interpreted as showing the negative effect of industrial fragmentation on productivity.

20.5 TRADE LIBERALISATION AND INDUSTRIAL PRODUCTIVITY

There are reasons to believe that trade liberalisation will promote industrial productivity:

a) There will be increased competitive pressure on domestic firms to improve efficiency.

b) There will be greater access to imported machinery, parts and components, enabling domestic firms to improve productivity.

c) Trade liberalisation will increase export possibilities; domestic firms can expand and reap economies of scale.

There have been a number of studies for developing countries in which the effect of trade liberalisation on industrial productivity has been examined. Overall, the empirical evidence is mixed. No strong support is found for the hypothesis that trade liberalisation will improve industrial productivity. Some studies have found a favourable effect of trade liberalisation; others have not. As for India, there is some evidence to indicate that trade restrictions had an adverse impact on industrial productivity. But, the evidence is sketchy, and one cannot be very confident of a favourable effect of trade liberalisation on industrial productivity.

Check Your Progress 4

1) Fill in the blanks:

   There is ..... (wide/small) inter-industry variation in productivity growth. Industry-wise growth rates in TFP growth has ..... (high/low) correlation with industry-wise growth rates in labour and capital productivity. Output growth rates have a ..... (positive/negative) correlation with productivity growth.

2) Name three industries, which had significant growth in TFP in the period 1959-60 to 1985-86. Name three industries, which had a significant fall in TFP.

Significant growth in TFP:

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Significant fall in TFP:

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3) Give reasons (in one or two sentences) for the following relationships found in some productivity studies on Indian industry:

   a) A positive relationship between output growth and productivity growth

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   b) A negative relationship between import substitution and productivity growth

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4) List two reasons for expecting a favourable effect of trade liberalisation on industrial productivity.

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20.6 LET US SUM UP

During the last fifty years, there was a consistent upward trend in labour productivity and capital intensity in Indian industry. In this period, there was a downward trend in capital productivity. A large part of the increase in labour productivity was due to substitution of labour by capital.

Labour productivity and capital intensity grew rapidly in the period 1951 to 1970. In the 1970s, the growth rates of labour productivity and capital intensity were relatively much lower. In the period 1980 to 1997, the average growth rates in labour productivity and capital intensity were more than six per cent per annum.

During the 1950s and 1960s, the growth rate of total factor productivity (TFP) in Indian industry was very low. In the 1970s and 1980s, there was a significant growth in TFP. In the 1990s, there was a marked slowdown in TFP growth in Indian manufacturing.

There is wide inter-industry variation in productivity growth rates. Industry-wise growth rates in TFP have a high positive correlation with industry-wise growth rates in labour productivity and capital productivity. Inter-industry regression analysis reveals that productivity growth has a positive relationship with output growth and a negative relationship with the degree of import substitution, capital-labour ratio and the rate of increase in the number of factories.

There are reasons to expect a favourable effect of trade liberalisation on industrial productivity. However, we do not have strong empirical evidence in support of this hypothesis. One cannot be very confident that trade liberalisation will improve industrial productivity in India.

20.7 KEY WORDS

Labour Productivity: Ratio of output to labour input.

Capital Productivity: Ratio of output to capital input.

Total Factor Productivity: Ratio of output to total input, indicating overall efficiency in production.

Capital Intensity: Ratio of capital to labour input, showing relative importance of capital and labour in production process.

Import Substitution: Industrial growth through substitution of imports by indigenous production.

Trade Liberalisation: Lowering tariff and other barriers to international trade.

Correlation Coefficient: A statistical measure of the degree of linear relationship between two variables.

Regression Analysis: It is a statistical technique for analysing relationship between variables.

20.8 SOME USEFUL BOOKS AND REFERENCES

I.J. Ahluwalia,(1991). *Productivity and Growth in Indian Manufacturing*, Oxford University Press, Delhi.

B.N. Goldar, (1986). *Productivity Growth in Indian Industry*, Allied Publishers, New Delhi.

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20.9 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) An import-substitution oriented; high; strong; an adverse; respectively.

2) Labour productivity: the ratio of real value added to employment. Capital productivity: the ratio of real value added to the value of fixed capital stock at constant prices.

3) i) T; ii) F; iii) T; iv) F

Check Your Progress 2

1) four per cent; one per cent; six per cent; respectively.

2) i) T; ii) T; iii) F; iv) T

3) See Sub-section 20.2.3

Check Your Progress 3

1) low; improved; come down; respectively.

2) See Sub-section 20.3.1

3) Ahluwalia; Trevedi, Prakash and Sinate

4) See Sub-section 20.3.4

Check Your Progress 4

1) wide; high; positive; respectively

2) See Sub-section 20.4.1

3) (a) see Sub-section 20.4.2; (b) see Sub-section 20.4.3

4) See Section 20.5