

CHAPTER FIVE

IRON AND STEEL INDUSTRY : ITS EFFICIENCY

Efficiency of an industry is a multi dimensional concept. No single criterion will explain all the variations in the performance of an industry or a plant. Economists therefore, rely on a large number of criteria to measure the performance or make a comparative study. Such criteria include the measures like labour productivity capital productivity, rate of return, wages per worker, cost per unit of output, composition of different types of costs change in the cost structure, capital intensity, capacity utilisation and export performance etc.

In the present chapter an attempt is made to examine the performance of Iron and Steel industry with the help of some of the criteria mentioned above. Different plants considered are Bhilai, Rourkela, Durgapur, TISCO (Tata Iron and Steel Company) IISCO (Indian Iron and Steel Company). The first three plants are under public sector right from the beginning. Bokaro the public sector steel plant is not included because it started functioning recently. While IISCO which was under private sector until recently has been taken over by the government. TISCO is the only plant which now remains under private sector. Since TISCO, was taken over by the government .

recently, we will group both TISCO and TISCO as private sector concerns.

5.1 PRODUCTIVITY AS A MEASURE OF EFFICIENCY :

Productivity raises innumerable problems of definition and measurement. The concept either can be a total factor productivity or a partial productivity measure. The total factor productivity compares total output to a weighted composition of inputs usually labour and capital.¹

The term 'productivity' is generally taken as labour productivity resultant of factors such as skill and dexterity, technical improvements and managerial efficiency etc. Labour productivity indicates the degree of utilisation of work force and is dependent on capital intensity and improvements in technical know-how. A partial productivity does not represent either the contribution or share of labour or capital. Trends in productivity will only show the general relationship between output and inputs. Productivity is being understood as the optimisation of the use of all available resources such as money material, machines, manpower and space etc.²

1 K.L.Krishna "Total factor productivity concept and measurement" NPC productivity Journal Vol.10, No.4,1970. Pp. 701-705, as quoted in productivity Trends in Iron and Steel Industry in India - NPC-1974 - P.3

2. VKS.Menon "Productivity agreements, why, what and how ? Financial Express dt. 22-3-80.

A small increase in capital employed may be associated with a big increase in labour productivity. It would be wrong to attribute the whole of this gain to the Capital expenditure.³ The increase in labour productivity is partly due to changes in Capital intensity and technical and organisational knowledge.

At least until 1964, the Principal, if not the sole criterion by which the public sector mills were judged was output.⁴ Even to-day i.e., 1981, efforts continue to be made to quote output figures as a mark of achievement by the steel mills. But emphasis on output and output alone, if the past experience is any guide, may result in neglecting other important objects such as quality or cost minimisation.

5.1.1 Productivity as a measure - Some limitations :

Productivity as a measure of performance continues to be used in spite of its limitations. Productivity is not all good a measure of efficiency because it cannot explain all the differences in structure, quality, skill and technical know how. Productivity cannot be used for a comparison because inter-firm and inter-industry variations exist in accounting practices, for example in Japan earnings are probably under estimated because of the extensive provision of fringe benefits and productivity over guaged because

3. K.D.George - Productivity and capital expenditure in Retailing. p.12.

4. W.A.Johnson - The Steel Industry of India P 156.

of the practice of contracting out for certain classes of labour particularly for maintenance.⁵

A comparison between steel plants in terms of labour productivity will not be easy because of various differences in respect of equipment and technology, product mix, capacity utilisation of the production units, state of maintenance of equipment, extent of work, leave entitlement, absenteeism etc.⁶

Productivity as a measure is inappropriate for one industry alone, this cannot be applied to national income generated by technological change. It can not measure the degree of response of the management to market pressures to minimize costs. Another economist denounced the use of productivity as a measure of performance. "Productivity an estimate of output per labour worked, is a notoriously poor measure of efficiency".⁷

5.1.2 Use of Productivity indices :

The fact that labour or capital has been used as a basis to assess the respective productivity performance shows only the necessity to relate the efficiency of the firm of the industry or the economy after reducing the input output

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5. Cockrill - The steel Industry - P. 31.
 6. Committee on Public undertakings 1973-74, (fifth Lok Sabha) Forty first Report, HSL, P. 43.
 7. Burton, G. Malkiel "Productivity the problem behind the headlines". Harvard Business Review - May-June 1979, p.81.

relationship to comprehensive comparable quantities. As such partial productivity indices provide limited scope for interpretation.⁸

5.1.3 Physical Productivity of Labour :

Labour productivity, customarily defined as output per man year, has shown declining trend in Indian steel mills except Bhilai.

It is apparent from the statement Table V.1 that except Bhilai, other steel mills including private sector steel mills, have registered decline in physical productivity. Bhilai tops the list in average physical productivity during the period 1961-62 to 1976-77.

It is interesting to note that labour productivity measured as gross value added per worker at 1961-62 prices shows upward trend in all steel mills except IISCO as presented in Table V.2

It is apparent from the table that IISCO, recorded a noticable decline in labour productivity at constant prices. The private sector TISCO mill lagged behind public sector steel mills in the growth of labour productivity.

5.1.4 Capital Productivity :

The capital productivity measured as gross value added to gross fixed assets, at 1961-62 prices shows upward trend in all

8 National Productivity Council - Productivity Trends in Iron and Steel Industry. P.4.

Table V.1

Trends in Physical Productivity of LabourIndian Steel Mills.

Tons of Ingots per man year

Year	Bhilai	Rourkela	Durgapur	TISCO	IISCO
1961-62	77	80	45	-	-
1962-63	63	58	55	62	69
1963-64	66	72	58	64	69
1964-65	60	68	68	68	65
1965-66	57	60	64	64	68
1966-67	75	45	52	70	44
1967-68	70	40	48	67	39
1968-69	63	41	56	62	39
1969-70	72	40	53	59	35
1970-71	42	31	32	-	-
1971-72	39	24	23	-	-
1972-73	72	50	31	-	31
1973-74	63	42	33	45	30
1974-75	65	41	32	40	33
1975-76	70	49	39	45	40
1976-77	73	55	-	45	40
Mean	68	53	49	58	46

Source : For the period 1961-62 to 1969-70 - Productivity Trends in Iron and Steel Industry in India. P.56.

-T.4.5(a)

(2) Annual Reports SAIL-Sales Statistics-1973-78
The figures are rounded off.

(-) indicates non availability of data.

Table V.2

Gross Value added per Worker in Indian Steel Mills1961-62 Prices

Index Numbers

Year	Bhilai	Rourkela	Durgapur	TISCO	IISCO
1961-62	100	100	100	-	-
1962-63	99	149	405	100	100
1963-64	118	226	672	104	111
1964-65	116	240	679	116	119
1965-66	106	238	625	116	84
1966-67	129	173	468	113	76
1967-68	127	161	360	102	62
1968-69	136	203	424	101	68
1969-70	141	266	450	107	69
g	3.89 PC	11.48 PC	18.19 PC	0.85 PC	-4.75 PC

Source :- Productivity Trends in Iron and Steel Industry

P-60-Table 4.7(a)

g = annual compound growth rates percentages -

(-) indicates non-availability of data -

Table V.3

Capital Productivity Gross Value added to Gross Fixed
Assets - in Real Terms - Indian Steel Mills - (a)
1961-62 prices

Year	Index Numbers				
	Bhilai	Rourkela	Durgapur	TISCO	IISCO
1961-62	100	100	100	100	100
1962-63	169	236	747	119	101
1963-64	207	260	1381	133	115
1964-65	210	459	1550	149	128
1966-67	225	400	1317	146	123
1967-68	215	327	1037	131	103
1968-69	242	423	1277	131	103
1969-70	269	534	1408	141	102
g	11.62 PC	20.46 PC	34.16 PC	3.89 PC	0.22 PC

a) Source - Productivity trends in Iron and Steel Industry
by NPC P-53. Table 4.4 (a)

g = annual compound growth rates in percentages.

steel plants except IISCO, in which the increase was nominal at the end of 1969-70, as indicated in Table V.3.

It is apparent that the private sector steel plants are placed unfavourably against public sector steel mills, in terms of capital productivity. This exercise shows better performance by the public sector steel mills measured in terms of capital productivity in real terms during the period under consideration.

The National Productivity Council in its research project found that Capital productivity was lagging in public sector steel mills behind that of private sector steel plants at current prices.

5.2 UNIT COST AS A MEASURE :

Unit cost as a measure of efficiency should be used with caution, because unit cost cannot explain the differences between firms in age, structure and product mix. Unit cost is used as a device to detect and check the inefficiency in any enterprise, and comparison of firms on the basis of unit costs involves risks. In spite of its limitations unit cost is used for comparison of firms assuming similar conditions.

Table V.4 exhibits the trends in Unit costs of Steel mills in India during the period 1961-62 to 1969-70, at 1960-61 prices.

It can be seen from the table that the works cost per tonne of steel ingot at constant prices shows a downward trend in general, giving either negative or very negligible annual growth rate.

Table V.4

Works Cost per Tonne of Steel Ingot. Indian Steel
Mills at - 1960-62 Prices.

Year	Bhilai	Rourkela	Durgapur	TISCO	IISCO
1961-62	346	557	570	371	518
1962-63	402	418	394	355	512
1963-64	342	428	334	344	447
1964-65	347	360	330	325	448
1965-66	324	313	325	294	443
1966-67	271	344	322	255	414
1967-68	343	399	398	289	452
1968-69	338	395	389	307	499
1969-70	353	400	417	313	510
g	0.19	-3.75	-3.53	-1.91	0.17

Sources : Productivity Trends in Iron and Steel NPC - P.64

the figures are rounded off.

g = annual compound growth rate - percentage.

5.3 LABOUR COSTS :

The proportion of labour cost in the total works cost shows an increasing trend in Bhilai, Durgapur and IISCO Plants. While it appears to have remained around 20% in Rourkela and around 28% in TISCO plant. It is interesting to note that it is in the private sector plants i.e. TISCO and IISCO where the percentage of labour cost is high (30% in 1969-70) as compared to that of public sector plants (around 20% in 1969-70). Thus a higher wage cost component reflects a better performance and improved labour welfare in the private sector plants.

5.4 CAPACITY UTILISATION :

The unit cost will depend on the degree of capacity utilisation. Table V.6 provides broad indication of trends in capacity utilization. Capacity utilisation is an indication of over all efficiency of any firm.² The data presented in Table V.6 are summarised below.

UTILIZATION OF CAPACITY IN INDIAN STEEL MILLS (PERCENTAGES)

	1961-62	1977-78	Average capacity utilisation.
1. Bhilai	65	95	85
2. Rourkela	26	78	63
3. Durgapur	45	68	55
4. TISCO	88	98	94
5. IISCO	92	65	74

² Please see a note on capacity utilization.

Table V.5

Labour Cost as Percentage of Total Works Cost at
Indian Steel Mills at Current Prices.

Year	Bhilai	Rourkela	Durgapur	TISCO	IISCO
1961-62	13	23	9	29	21
1962-63	15	18	14	28	22
1963-64	16	18	15	26	23
1964-65	16	16	17	26	24
1965-66	16	19	17	27	24
1966-67	17	20	23	28	25
1967-68	18	23	25	29	29
1968-69	19	21	23	30	27
1969-70	18	21	23	30	30

Source : Productivity Trends in Iron and Steel Industry by
 NPC. p-67

Percentages have been rounded off.

It is apparent from the statement that IISCO should a decline in capacity utilisation during the period, but on the average its degree of capacity utilisation is higher than public sector steel mills Rourkela and Durgapur. Bhilai stands second when the mills are arranged in terms of capacity utilization and TISCO tops the list.

Although actual capacity is probably greater than rated capacity at most mills, Bhilai's actual capacity is substantially in excess of its rated capacity. Built in excess capacity has provided Bhilai with an initial advantage. Because the plant has met its output targets with relative ease, its management has been able to tackle other equally important problems. Several of the difficulties incurred by Rourkela and Durgapur have resulted from their attempts to emulate Bhilai's output achievements without this cushion encouraging the sacrifice of other objectives that conflict with production.¹⁰

Excess capacity or surplus capacity, in this industry is attributed to a number of factors, and this trend is witnessed in most countries.

There was a trend increase in the percentage of unused capacity in the industry throughout the period. In 1955 the degree of utilisation was 98 percent by 1966 it had fallen to 78.8 P.C. This occurred largely as a result of the failure

10 W.A.Johnson - The Steel Industry of India. P. 157

Table V.6

Trends in Capacity Utilization in India.Iron and Steel Industry, Percentages (Steel Ingots)

Year	Bhilai	Rourkela	Durgapur	TISCO	IISCO
1961-62	65	26	45	88	92
1962-63	102	58	62	94	99
1963-64	114	78	89	100	101
1964-65	118	96	89	105	94
1965-66	--	--	--	105	90
1966-67	69	55	44	105	89
1967-68	65	52	43	104	77
1968-69	70	63	40	98	80
1969-70	79	65	40	97	71
1970-71	78	58	40	86	63
1971-72	78	46	44	85	62
1972-73	84	65	45	85	43
1973-74	76	60	49	76	44
1974-75	80	59	51	86	53
1975-76	88	71	63	89	63
1976-77	92	83	68	95	67
1977-78	95	78	68	98	65
Mean	85	63	55	94	74

Sources : upto 1969-70, productivity trends in Iron and Steel Industry in India by NPC - P.47

2) Annual Reports on the working of Industrial and commercial undertakings of the Central Government from 1970-71 to 1977-78.

(-) Indicates non availability of data.

of the forecast, increase in demand for steel products to materialise and unit costs were elevated as a consequence. In addition, the development of chronic surplus capacity was a feature of the steel industries of most other countries, and this depressed export prices.¹¹

Major constraints faced by the steel mills were, power restrictions, poor quality of raw material and industrial relations problems.¹² But except Durgapur, the average degree of utilisation of capacity during the period 1961-62 to 1977-78, in other public sector steel mills is not far from satisfactory.

5.5 CONCLUSION :

To conclude, out of the various measures of efficiency examined, productivity of labour measured by tons of ingots per man year gives decline in all the five plants of Iron and Steel industry between 1960-61 and 1976-77. The decline, however, is found rather sharp in the plants which fall under private sector TISCO and IISCO. The labour productivity in the case of Bhilai plant is relatively high on an average and even shows rise between 1962-63 and 1976-77.

Gross value added per worker on the other hand gives a rising trend in all the public sector plants.(Table V.2). TISCO gives only 0.85% rise in the annual rate of growth while

11. Cockerill - The steel Industry P. 53,54.

12. B.P.E. Annual Report - Vol. I. P. 139. 1977-78.

IISCO shows a fall of little less than 5 per cent rate of growth. Thus the private sector plants do not show a better performance on account of Gross value added per worker. Capital productivity also indicates a rising trend, although not very sharp in the private sector steel plants. Total cost per tonne of steel ingot has declined in both public sector and private sector plants between 1961-62 and 1969-70. The annual rate of growth of such a unit cost is either negative or very negligible during the period.

The proportion of labour cost is found high in the private sector steel plants. The trends are mixed and not very profound. As regards capacity utilisation, it is IISCO which indicates a declining trend. TISCO, however has the highest (98 per cent) capacity utilisation on an average.