CHAPTER-8:

COMPARATIVE ADVANTAGE OF INDIAN STEEL SECTOR

8.1. Factors determining Competitiveness

8.2. A SWOT analysis of Indian steel Industry

8.3. Strategy of competitiveness

8.4. Suggested measures

8.5. Techno economic improvement

8.6. Technology issue of Indian steel Sector

8.7. Sensitivity of steel demand to price
CHAPTER-8: Competitiveness of Indian Steel industry:

Competitiveness has become a matter of survival in the present era of globalised economy. There are no free lunches. In its very basic form enhanced competition implies that the consumers of a given output or service have the choice of acquiring the same from many sources. In a business like steel where the end product is basically a semi-finished product and undergoes several downstream processing steps before it is actually put to commercial use, multiple choice options renders it more susceptible to competition. Indian steel industry must therefore be able to face the global steel market to survive and succeed.

8.1. Factors determining competitiveness:

Competitiveness in steel industry is dependent on the following factors:

- State of the technology
- Infrastructure
- Financial Costs
- Availability and cost of inputs
- Manpower productivity
- Exchange rates

In this globalised market economy any organisation, to be competitive and to stay ahead, must have the following capabilities:-

- Anticipate changes in the competitive surroundings and respond quickly to them. This requires both a broad view of larger market forces and a flexible decentralized environment, which allows quick decision-making at all levels of the company, especially at levels closest to the customer.
- Knowledge of the company’s strengths and then taking advantage of them. Do what one does best, i.e. stick to the core competence, and, wherever possible, exploit high quality market niches in which the company has strength and some unique advantage.
➢ Recognise that technology is a powerful weapon for corporate change, both as a source of new products and services and also as a way of dramatically increasing productivity.

➢ Never to lose sight of the future and at the same time not to forget the present. Ideally, a balance has to be struck between long-term advantages and goals against short-term performance pressures to create a business that is strong today and will be stronger tomorrow.

8.2. A SWOT ANALYSIS of INDIAN STEEL INDUSTRY:

Strengths:

India has rich mineral resources. It has abundance of iron ore, coal and many other raw materials required for iron and steel making. It has the fourth largest iron ore reserves (10.3 billion tonnes) after Russia, Brazil, and Australia. Therefore, many raw materials are available at comparatively lower costs. It has the third largest pool of technical manpower, next to United States and the erstwhile USSR, capable of understanding and assimilating new technologies. Considering quality of workforce, Indian steel industry has low unit labour cost, commensurate with skill. This gets reflected in the lower production cost of steel in India compared to many advanced countries (Table 8.1). With such strength of resources, along with vast domestic untapped market, Indian steel industry has the potential to face challenges successfully.
### Table 8.1. Cost competitiveness

<table>
<thead>
<tr>
<th>Item</th>
<th>USA</th>
<th>Japan</th>
<th>Germany</th>
<th>U.K.</th>
<th>CIS</th>
<th>China</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency / $</td>
<td>1.00</td>
<td>1.22</td>
<td>2.11</td>
<td>0.68</td>
<td>28.7</td>
<td>8.28</td>
<td>46.5</td>
</tr>
<tr>
<td>L/O Ratio: Liquid steel / CRS</td>
<td>1.154</td>
<td>1.135</td>
<td>1.152</td>
<td>1.152</td>
<td>1.208</td>
<td>1.22</td>
<td>1.23</td>
</tr>
<tr>
<td>Coke/ Coal</td>
<td>27</td>
<td>27</td>
<td>26</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>50</td>
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<tr>
<td>Iron ore</td>
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<td>62</td>
<td>58</td>
<td>63</td>
<td>75</td>
<td>39</td>
</tr>
<tr>
<td>Scrap/ DRI</td>
<td>33</td>
<td>23</td>
<td>21</td>
<td>23</td>
<td>24</td>
<td>15</td>
<td>33</td>
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<tr>
<td>Total raw material cost</td>
<td>115</td>
<td>106</td>
<td>109</td>
<td>105</td>
<td>113</td>
<td>118</td>
<td>122</td>
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<tr>
<td>Labour cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment cost/ hour</td>
<td>38.0</td>
<td>36.0</td>
<td>34.0</td>
<td>27.6</td>
<td>1.5</td>
<td>1.3</td>
<td>2.5</td>
</tr>
<tr>
<td>MH/ tonne</td>
<td>4.1</td>
<td>4.0</td>
<td>4.0</td>
<td>4.1</td>
<td>15.8</td>
<td>20.9</td>
<td>26.5</td>
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<tr>
<td>Total labour cost</td>
<td>154</td>
<td>142</td>
<td>136</td>
<td>113</td>
<td>23</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>Total operating cost</td>
<td>441</td>
<td>398</td>
<td>392</td>
<td>371</td>
<td>270</td>
<td>297</td>
<td>348</td>
</tr>
<tr>
<td>Total financial expense</td>
<td>39</td>
<td>60</td>
<td>40</td>
<td>48</td>
<td>27</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>Pretax cost</td>
<td>480</td>
<td>458</td>
<td>432</td>
<td>417</td>
<td>297</td>
<td>347</td>
<td>423</td>
</tr>
<tr>
<td>Liquid steel</td>
<td>199</td>
<td>166</td>
<td>162</td>
<td>154</td>
<td>138</td>
<td>152</td>
<td>169</td>
</tr>
<tr>
<td>Overhead</td>
<td>441</td>
<td>398</td>
<td>392</td>
<td>371</td>
<td>270</td>
<td>297</td>
<td>317</td>
</tr>
</tbody>
</table>

**Source:** IISI

**Weaknesses:**

**Endemic Deficiencies:**

These are inherent in the quality and availability of some of the essential raw materials available in India, eg, high ash content of indigenous coking coal adversely affecting the productive efficiency of iron-making and is generally imported. Advantages of high Fe content of indigenous ore are often neutralized by high basicity index. Besides, certain key ingredients of steel making, eg, nickel, ferromolybdenum is also unavailable indigenously.
Systemic Deficiencies:
However, most of the weaknesses of the Indian steel industry can be classified as systemic deficiencies. Some of these are described here.

High Cost of Capital:

Steel is a capital intensive industry; steel companies in India are charged an interest rate of around 14% on capital as compared to 2.4% in Japan and 6.4% in USA.

Low Labour Productivity:

In India the advantage of cheap labour gets offset by low labour productivity; eg, at comparable capacities labour productivity of SAIL and TISCO is 75 t/man year and 100 t/man year, for POSCO, Korea and NIPPON, Japan the values are 1345 t/man year and 980 t/man year.

The following table (table no.8.2.) shows total employment in steel sector of different countries:

<table>
<thead>
<tr>
<th>Country</th>
<th>1990</th>
<th>1995</th>
<th>1997</th>
<th>1999</th>
<th>2001</th>
<th>2003</th>
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<tbody>
<tr>
<td>France</td>
<td>46</td>
<td>39</td>
<td>38</td>
<td>38</td>
<td>34</td>
<td>33</td>
</tr>
<tr>
<td>Germany</td>
<td>125</td>
<td>93</td>
<td>82</td>
<td>78</td>
<td>76</td>
<td>75</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>51</td>
<td>38</td>
<td>36</td>
<td>31</td>
<td>28</td>
<td>27</td>
</tr>
<tr>
<td>United States</td>
<td>204</td>
<td>171</td>
<td>162</td>
<td>153</td>
<td>147</td>
<td>143</td>
</tr>
<tr>
<td>Japan</td>
<td>305</td>
<td>252</td>
<td>230</td>
<td>208</td>
<td>202</td>
<td>198</td>
</tr>
<tr>
<td>South Korea</td>
<td>67</td>
<td>67</td>
<td>65</td>
<td>64</td>
<td>63</td>
<td>61</td>
</tr>
<tr>
<td>Australia</td>
<td>30</td>
<td>22</td>
<td>20</td>
<td>24</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>India</td>
<td>454</td>
<td>488</td>
<td>443</td>
<td>429</td>
<td>367</td>
<td>364</td>
</tr>
</tbody>
</table>
High Cost of Basic Inputs and Services:

High-administered price of essential inputs like electricity puts Indian steel industry at a disadvantage; about 45% of the input costs can be attributed to the administered costs of coal, fuel and electricity, eg, cost of electricity is 3 cents in the USA as compared to 10 cents in India; and freight cost from Jamshedpur to Mumbai is $50/tonne compared to only $34 from Rotterdam to Mumbai. Added to this are poor quality and ever increasing prices of coking and non-coking coal.

Other systemic deficiencies include:

- Poor quality of basic infrastructure like road, port etc.
- Lack of expenditure in research and development.
- Delay in absorption in technology by existing units.
- Low quality of steel and steel products.
- Lack of facilities to produce various shapes and qualities of finished steel on-demand such as steel for automobile sector, parallel flange light weight beams, coated sheets etc.
- Limited access of domestic producers to good quality iron ores which are normally earmarked for exports, and
- High level taxation.
Besides these Indian steel makers also lack in international competitiveness on determinants like product quality, product design, and on-time delivery, post sales service, distribution network, managerial initiatives, research and development, information technology and labour productivity etc. As is evident in Table 8.1, the weaknesses gets reflected in India’s poor standing in the global competitiveness as measured in terms of indicated parameters.

**Opportunities:**

The biggest opportunity before Indian steel sector is that there is enormous scope for increasing consumption of steel in almost all sectors in India. Table 6.2 gives a glimpse of untapped potential of increasing steel consumption in India; eg, even to reach the comparable developing and lately developed economies like China and other Europe, a quantum jump in steel consumption will be required.

**Unexplored Rural Market:**

The Indian rural sector remains fairly unexposed to their multi-faceted use of steel. The rural market was identified as a potential area of significant steel consumption way back in the year 1976 itself. However, forceful steps were not taken to penetrate this segment. Enhancing applications in rural areas assumes a much greater significance now for increasing per capital consumption of steel. The usage of steel in cost effective manner is possible in the area of housing, fencing, structures and other possible applications where steel can substitute other materials which not only could bring about advantages to users but is also desirable for conservation of forest resources.

**Other Sectors:**

Excellent potential exist for enhancing steel consumption in other sectors such as automobiles, packaging, engineering industries, irrigation and water supply in India. New steel products developed to improve performance simplify manufacturing/installation and reliability is needed to enhance steel consumption in these sectors. Main objective here have to be improvement of quality for value
addition in use, requirement of less material by reducing the weight and thickness and finally reduction in overall cost for the end user.

Latest technology must be adopted by Indian steel manufacturers for production of superior quality of steel for these applications. For example, pre-coated sheets can be used in manufacture of appliances, furnishings, electric goods and public transport vehicles. Production and supply of superior grades of steel in desired shapes and sizes will definitely increase the steel consumption as this will reduce fabrication need; thereby reducing cost of using steel.

Few other perceived opportunities are:

Export Market Penetration:

It is estimated that world steel consumption will double in next 25 years. Quality improvement of Indian steel combined with its low cost advantages will definitely help in substantial gain in export market.

Threats:

Slow Industry Growth:

The linkage between the economic growth of a country and the growth of its steel industry is strong. The Indian steel industry is no exception. The growth of the domestic steel industry between 1970 and 1990 was similar to the growth of the economy, which as a whole was sluggish at 9 percent. This sluggish growth in the steel industry has resulted in enhanced rivalry among existing firms. As the industry is not growing the only other way to grow is by increasing one’s market share. Consequently, the Indian steel industry has witnessed spurts of price wars and heavy trade discounts, which has done Indian steel industry no good as a whole.

Threat of Substitutes:
Plastics and composites pose a threat to Indian steel in one of its biggest markets i.e. automotive manufacture. For the automobile industry, the other material at present with the potential to upstage steel is aluminium. However, at present the high cost of
electricity for extraction and purification of aluminium in India weighs against viable use of aluminium for the automobile industry. Steel has already been replaced in some large volume applications: railway sleepers (RCC sleepers), large diameter water pipes (RCC pipes), small diameter pipes (PVC pipes), and domestic water tanks (PVC tanks).

**Technological Change:**

Technological changes often force the industry structure to change. For a developing country like India where capital itself is costly, technological obsolescence is a major threat.

**Price Sensitivity and Demand Volatility:**

The demand for steel is a derived demand and the purchase quantity depends on the end-use requirements. The traders tend to exhibit price sensitivity and buy when there are discounts. This volatility of demand often affects the integrated steel manufacturers because of their inability to tune their production in line with the market demand fluctuations. Some other threats are:

- Ever decreasing import duty on steel.
- Dumping of steel by developer countries.
- High quality products from developed countries available for import at very competitive prices.
- Non-availability of capital from financial institutions for iron and steel sector.

**8.3. Strategy for Competitiveness**

The state of competitiveness depends on five basic competitive factors which are:

- Potential entrants – the threat of new entrants into the industry.
- Threat of substitution – substitute products being developed which could edge out the traditional ones.
• Bargaining power of the buyers – this is more so when the buyer is knowledgeable and has a wide choice of suppliers.
• Bargaining power of suppliers – the threat of inputs to industry rising in terms of cost or falling in terms of quality.
• Rivalry among competitors or jockeying for number one position.

All the five competitive forces jointly determine the intensity of industry competition and thereby its profitability.

In steel industry the key forces are foreign competition and substitute materials. While the substitute materials are not of alarming importance for the Indian steel industry, the former is definitely more important today in changed economic scenario.

The Role of R&D
The role of technology needs no further emphasis in an industry like steel. In formulating a competitive strategy, developing a new product or even providing satisfactory customer service, it is critically important to make the right choice of technologies. This requires continuous analysis and linkage of alternative technologies with all the attendant attributes of economic and social acceptance. Issues involved many co-ordinations in technology development for global strategy. R&D must play its role in product development for worldwide markets. This presumes that R&D function has an unusual knowledge of technical issues and buyer needs globally. Similarly, process R&D is crucial in global industry to facilitate the development of global scale economies and for learning how to achieve consistent quality. Not only R&D develops new products and new processes, but technical innovation through R & D also helps to increase market share and enables to reap more from past as well as present investments must also transfer these new processes technology.

Human Aspects
To remain competitive, the employees need to be empowered through training and by giving them a financial stake in the business; Companies have to realize that people provide the ultimate competitive edge.
Benchmarking

Con-steel in England concluded a benchmarking study of its competitors to find the competitive gap. They developed a model. This involved six goals to come on the top. They are:

- Cross-train employees and use process control internally to make improvements.
- Discover the best practice reference plant in the world.
- Facilitate rapid information gathering in new practice.
- Send 20 percent of its employees to work in the best reference plant.
- Monitor and promote successful change.
- Become the best reference plant

Indian steel should follow the example.

Customer Satisfaction and Customer Needs

Customers today expect materials as per specified delivery time schedule and quality. It may appear that sometime they make unreasonable demands. The most attractive customers are often the most difficult to satisfy. These customers are demanding— and they know exactly what meets their needs, and if one can satisfy them, they like to shift loyalty.

- Being responsive to the needs of the customer pay in several ways.
- Customers are more loyal to suppliers who are consistently responsive to their needs.
- Customers will pay a premium over the typical price to a responsive supplier.
- Customer will buy more goods and services from a responsive supplier.
- The supplier becomes strategically advantage when it secures the demanding customer.

From the point of view of customer’s orientation, there are three types of companies: Companies that try to lead customers where they do not want to go; companies that listen to customers and then they respond to their articulated needs; and companies that lead customers where they want to go without being fully aware of it. Companies
that do the last or create tomorrow not only satisfy customers, they amaze them by constantly exceeding their expectations.

**New Products and Business Areas**

The idea of value to the customer lies at the heart of new product and service development; technologically new products that are successful can be more expensive than older products but the services they deliver have to be better in a way that justifies the price.

Process innovations in steel making which initially add to production cost but end up increasing quality and allowing more flexibility in response to customer demand, e.g., secondary steel making including argon rinsing powder injection and ladle metallurgy, have several benefits resulting in improved quality products and a satisfied customer.

**Pricing of steel in a Free Market Economy**

In India for several decades steel prices worked because of cost plus. Whenever the cost of inputs used to increase, the steel plants used to be granted price increase by the JPC. After the opening of the economy, the scenario is different today. There is total freedom for entry of international capital and technology into the country, and there is no licensing requirement. There is also gradual reduction of customs duty to the internationally accepted levels.

The Indian market today has to operate in the steel market of the world and therefore must learn to accept the happenings in the world steel market. World market prices will also decide the prices in the domestic market. Global steel prices will determine the costs that Indian steel producers can afford and not the other way around. The other significant factor is that the affordable cost will determine the nature and type of the successful steel making technological for India.

It is observe that while the export prices of HRC and ribbed bars increased globally in the range of 30-40 per cent over a span of last 25 years the prices of these products increased by 600 to 700 per cent in the same period in Indian context. It is for these particular reasons that the Indian steel industry today is not competitive.

The world trend in steel prices also exhibits two other characteristics.
These characteristics are:

1. The prices exhibit a cyclical nature. The cycles are due to capital-intensive nature and long gestation period of steel industry.

2. The cycles are getting shorter and shorter due to the recent technological developments and faster creations of new capacities.

Indian steel will have to be ready for the effect of inevitable reduction in customs duties that are bound to take place in coming few years. The Indian steel prices in future are likely to remain at almost the current level over the next decades. This means that we have to adopt technologies and reduce production costs, which can best the normal inflation.

The integrated steel plants in India have the potential to produce lowest cost steel in the world. India will have to adopt new technologies that are cost effective and are able to meet the challenges of cost competitiveness.

8.4. Suggested Measures

The following measures that are internal to the corporate management could be termed as major determinants of competitiveness of Indian steel industry.

1. Market Survey – Regular market and demand surveys should be undertake both in the domestic and in the international market to ensure that the product mix remains in line with the structure of demand.

2. Capacity Utilisation – Efficient use of investment already undertaken needs to be emphasise in order to increase utilization of installed capacity in various shops to generate large surpluses.

3. Labour Productivity – More efficient deployment of the labour forces would be necessary. Labour productivity can be raised by redeployment, retraining and introduction of schemes for sharing of incremental gains from cost reductions. An important and related issue in steel plants has been the often-divergent objectives of the management and workers. One of the important methods for reconciling the objectives of various sections is to link partially the rewards with the overall performance. This will ensure that some co-
relation exists between the performance of the enterprise and the reward earned by the workers.

4. Monitoring Systems – A systems approach needs to be adopted after a proper identification of objectives and norms. Thus the adequate follow up and control through effective monitoring system for not only during the implementation phase of the projects also after its completion.

5. Cost Reduction Efforts – Cost reduction should be the primary function and not an incidental concern in the management of steel plants. This could be achieved by establishing sharp focus in all areas of operation and giving them high visibility. The sharing of incremental gains should be adopted as a performance criteria vis-à-vis targets. Once adequately conceived and properly implemented, this could be the single most significant human resource application for international cost competitiveness at virtually no cost.

6. Measures related to cost economics should be undertaken to reduce cost of raw material consumption. A 10 per cent reduction in consumption would yield a saving of 4-4.5 per cent in total cost.

7. All activities should be target oriented and key result areas need to be regularly identified. Energy conservation through recovery measures, maintenance and cost reduction programmes need to be regularly implemented.

8. An environment of extensively protected domestic market and a cost plus pricing regime in the past presented little or no challenge to the management of the steel plants in India. In contrast, exposure to highly competitive global market conditions has pushed the management of steel plants in other countries to minimize costs as far as possible. As a result these plants have seen the emergence of a closely co-ordinated and innovative functioning of corporate management.

9. By bringing these management practices to international state-of-the-art level and innovatively adopting them to the existing conditions and resource availability in the country, substantial cost reductions can be achieved with only marginal investment in plant and equipment.

10. The regulatory regime has now given way to market mechanism. Determined actions need to be taken. Strengths and opportunities of Indian steel industry are to be en-cashed for its future growth and development.
11. While the Indian Government needs to provide some protection for another few years by not lowering the import duties further, all the steel producers would need to improve process efficiencies so as to regain their standing in cost competitiveness. In spite of many odds, Indian Steel Industry is destined to achieve its global competitive position in the near future.

12. Indian Steel industry needs to invest substantial funds in order to keep pace with latest technology, not only for steel making, but also to provide secondary refining facilities at various rolling stages. The quality of HR Coil produced by Indian Steel Plants (public and private) is quite comparable with the international standards. The same applies for heavy plates (Bhilai Steel Plant) which have earned international recognition. For other downstream products like CR and GP etc., the producers in the private sector have also achieved export worthiness for their products in the international market. However, there is vast scope for quality up gradation of various steel categories produced by Indian Steel industry to make them internationally competitive.

13. Exchange rate depreciation has an immediate cascading impact on cost of import. SAIL is importing an average of 6 million tones of coking coal annually. A two percent exchange rate depreciation would imply a cost escalation of more than Rs. 35 crores.

14. Coking coal as an input to metallurgical coke should have a lower tax incidence than 5 percent (applicable on Metcoke). A zero duty on coking coal import with ash below 12 per cent and withdrawal of 4 per cent surcharge on all inputs that are not indigenously available, would translate into a savings of around Rs. 144 crores for SAIL alone. It would also bring about a reduction in raw material costs.

15. Port equipment, port handling facilities need considerable improvement. The lack of adequate infrastructure at the major ports at Haldia, Vizag etc. results in rise in handling costs of Indian steel.

The above actions may sound as routine, but they have the potential to make Indian steel competitive globally.

Competitiveness of an industry as a whole is not the same as for an individual company in it. An efficient individual company can flourish even if the other
companies in the industry (or the majority of it) are inefficient or the fundamental conditions determining competitiveness are missing in the economy. Competitiveness is determined by the state of technology, operational efficiency and the health of the plant over a period of time, availability and cost of capital and raw materials, state of infrastructure and logistics for movement of raw materials and finished products, productivity of labour and capital managerial excellence, innovation exchange rates, etc. The benchmark of competitiveness is the ability of the producer to sell at a competitive price.

8.5. Techno economic Improvement:

Various experts have closely looked into competitiveness of Indian steel industry. The increased presence of the Indian companies in the world market over the last decade has been taken as a pointer of enhanced competitiveness of the industry in India. However, the operational performance of most of the steel plants small or big have been found to be falling short of the levels achieved by the best companies internationally. Steel Authority of India Limited (SAIL) has improved its techno economics parameters in last few years to survive in this tough global competition.

Graph: 8.2.

![Energy Consumption (Gcal/tcs)](image)
Graph 8.3.

**Concast Production (Million Tonnes)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
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<tr>
<td>Rate</td>
<td>5.60</td>
<td>5.96</td>
<td>6.53</td>
<td>7.25</td>
<td>7.52</td>
</tr>
</tbody>
</table>

Graph 8.4

**Coke Rate (kg/thm)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
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<tbody>
<tr>
<td>Rate</td>
<td>568</td>
<td>557</td>
<td>538</td>
<td>542</td>
<td>536</td>
</tr>
</tbody>
</table>

Graph 8.5

**Manpower Productivity**

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
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<tbody>
<tr>
<td>Rate</td>
<td>96</td>
<td>105</td>
<td>111</td>
<td>123</td>
<td>137</td>
<td>144</td>
</tr>
</tbody>
</table>

Graph 8.6 Production Vs. Total Employment
8.6. Technology Issues of Indian Steel Industry

The Indian Steel Industry has grown over the last four decades using the following technological routes in the two different sectors.

**Primary Sector**
- Coke Ovens – Blast Furnaces – Basic Oxygen Furnace

**Secondary Sector**
- Scrap based EAF steel making;
- DRI based EAF steel making;
- Mini Blast Furnace based plants;
- Induction furnace based plants;

The technological performance of Indian steel plants in terms of specific energy consumption, specific consumption of raw materials and consumables, environmental and pollution norms and cleanliness is significantly lower than that of the advanced countries. On the other hand however, the newly commissioned steel plants compare favourable with the steel plants of developed nations.

We still produce around 14 per cent of our steel through OH route which is obsolete in other advanced countries. Only 25 per cent of Indian steel is secondary refined. It is much higher in the advanced countries. Only 51.0 per cent of India’s steel is continuously cast. Indian steel plants generate two times more slag and dust, 20 times more waste water and 5 times more waste gases compared to the developed countries. Energy consumption is 7 – 10 Gcal/tcs in India whereas it is only 4 – 6 Gcal/tcs abroad. Indian steel producers incur almost 40 cent of total costs on energy whereas it is much lower elsewhere.
However, in spite of all the inferior state of technology used, cost of production is low due to the low cost of primary raw material and labour. The indications are that these two advantages would get diminished in future making Indian steel less competitive unless our technology improves significantly and at a faster pace.

The inferior performance of the Indian steel plants is often due to the inefficient use of technology, mismatch between the imported technology with indigenous situation, obsolete technology and technological indiscipline. Further, the Indian steel industry until recently has been engaged in production-driven marketing instead of market-driven production as it should be. As a result, bulk of steel tonnage in India still belongs to the garden variety. There is still very little appreciation of what specific steel one should use for a given application.

Technological Performance Indices of Steel Industry in India

The technological performance norms of the BF-BOF and the EAF based routes in India are around 70 per cent of the corresponding norms in the technologically advanced plants abroad. However the performance norms of DR plants compare favourable with those of technologically superior plants elsewhere in the world.

Information Technology in Steel Sector IN Post –liberalised era:

There are quite a few market factors which affect the growth and development of steel sector. These factors are stated as below:

- Customer value maximization
- Steel processing innovations
- Infrastructure development
- Competitive posture
- Regional economic factors
- Change agents

A business group or a steel producer can assess its competitive gap and focus on the opportunities that are available to it. Information technology can play a very positive role in bring into sharp focus the contribution of these influencing factors.
The role of information technology is to provide the linkage through these market-influencing factors.

Maximising customer value emphasizes the concept of just-in-time deliveries and effective order management practices. The aspect of providing technical assistance as well as post sale collaboration and key problem resolution are linked. Plant location and delivery logistics play a very important role as well.

Innovation in steel making process requires the ability of steel producers to move processes from a pilot or R&D stage into production effectively. The availability of raw materials and proper grades of iron ore, coke and other materials influence the choice of an appropriate technology.

The efficiency with which producers bring these processes on line and the capability to manage process variations quickly often affect the ability of a producer to manage cost and retain market share. The use of information technology tools in this context include process controls, statistical analysis and quantitative modelling of the process.

The impact of the industry infrastructure are often factors of competition provided by the steel mills, market access and business diversity. The relevant impact of information technology is based on identifying via management practices, cost structure, that are responsive to changes and real time decision-making capabilities.

Regional economic factors include energy and environmental systems joint ventures and trade agreements that affect operations. The information technology perspectives thus focus on information exchange, monitoring system and simulation capability.

In the final analysis, steel industry players have to identify their own competitive postures in terms of matrix that it can manage and control.

Operating rates and the efficiency of its operations are a key to correlating costs, lead time, prime yields, inventory levels and the effective use of its productive assets.

The final set of market influencing factors lies in the ability of steel producers to harness external change agents and to rely on their internal ability to change. Such change is often introduced via business and management practices.

There are varieties of markets influencing factors in the steel industry. The opportunity to succeed lies in the ability of a steel player to simultaneously harness business issues and effective use of information technology tools.
8.7. Sensitivity of Steel Demand to Prices

An attempt has been made to estimate the sensitivity of the apparent steel consumption of selected producers to their own prices. The analysis has been restricted to only six products namely Angles, Joists, TOR Steel Plates, HR Coils/Skelp and CR Coils/Sheet. For all of these products, the recorded monthly apparent consumption levels have been regressed on their own prices, duly adjusted for inflation. The prices used as explanatory variables are the Mumbai market prices deflated by the WPI for basic metals. We have used monthly data dispatches (sales) for the period between January 1998 and December 2000 in the absence of sales data for Mumbai region only, which may have enhanced the precision of the result. We have used a double-log model of the following form to estimate the relationship between demand and price.

\[ \log(\text{Apparent Consumption}) = \log A + \log(\text{Price own}) + u \]

Analysis shows that Apparent consumption of all the products except that of TOR Steel is negatively related to their respective prices. A major share of TOR Steel consumption is accounted for by various government agencies such as the PWD, CPWD and the Housing Boards, whose demands are not very sensitive to prices.

(a) For all the product categories Apparent Steel Consumption is highly inelastic to changes in prices except for joists for which elasticity co-efficient is very high \(i.e. \ -3.37\). Demand for joists are extremely price sensitive because these are sold to individual house builders on piece basis. Therefore, lower sectional weight of individual joists rolled by Secondary Sector is, in general preferred.

(b) For none of the products price significantly affects the apparent Steel Consumption as can seen from the very low values of t – statistic and R-square.

I have made an attempt to analyses the effects of prices on the lagged apparent consumption of these selected products with almost similar results. The whole analysis underscores the fact that despite free movement of prices, there are other variables, which affect the demand for steel quite significantly. Some of the major factors like technological parameters guiding the end-using segments and prices of
substitutes of steel do impact demand for steel. However, there are some specific segments like residential construction, agricultural implements, packaging for non-petroleum products etc., which are price sensitive and steel products used in these segments may experience a decline in demand with increase in own prices. But this may not be reflected in the overall demand for a specific category where the above-identified segments do not figure as predominant ones.