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    NEED/IMPORTANCE OF THE STUDY

    STATEMENT OF THE PROBLEM

    OBJECTIVES

    HYPOTHESES

    RESEARCH METHODOLOGY

    RESULTS & DISCUSSION

    FINDINGS

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    SCOPE FOR FURTHER RESEARCH

    ACKNOWLEDGMENTS

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A STUDY ON STRUTURE AND GROWTH OF STEEL INDUSTRY IN INDIA

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ABSTRACT

The back bone of any economy is its industries. It is the industrial growth of a country that contributes to the faster growth of the economy. This realization has made the economic planners and practioners to implement various policies and programmes that are highly favorable for the development of industries. In the context of India, there are a few traditional industries which contribute to the faster industrial development and the steel industry is one. The Indian steel industry occupies the fifth place in the manufacturing of steel globally and hence it attracted the policy makers very much. With effect from 24-5-92 iron and steel industry was included in the list of 'high priority' industries for automatic approval for foreign equity investment up to 51 per cent (now 74 per cent). The import regime for iron and steel has undergone major liberalization moving gradually from a controlled import by way of import licensing, foreign exchange release, canalization and high import tariffs; to total freeing of iron and steel imports from licensing, canalization and lowering of import duty levels. Export of iron and steel items was also freely allowed. The government framed and implemented National Steel Policy in 2005. The long term strategic goal of NSP is that India should have a modern and efficiency steel industry of world standards, catering to diversified steel demand. Steel production has increased in accordance with the global production. In terms of value, at the aggregate level, the production of steel marked a compound growth rate of 7.788 per cent. The growth of capital in Indian steel industry was also estimated and found that the CGR was 4.081 for the entire industry where as it was 1.511 per cent and 4.289 per cent for the small and large firms respectively. There was a decline in the growth of employment while the average growth of global steel production was 5.195 per cent, steel production in India increased at an average rate of 8.162 per cent. Similarly, the share of India in the global steel production also increased from 2.925 per cent in 1997-98 to 3.970 per cent in 2006-07. A general conclusion that could be made from the analysis is that, in all the measures, there was a significant improvement in the Indian steel industry. The small firms may have certain advantages like lower wage rate, but the large firms, due to the benefits of scale of production, could perform much better than the small firms in the Indian steel industry during the period 1997-98 to 2006-07.

KEYWORDS
Import tariffs, Canalization, Foreign equity investment.

INTRODUCTION

The steel industry is one of the most energy intensive and highly technology intensive sector within the Indian economy. The progress of steel industry has a critical influence on the pace of development of India and as such great importance is attached to the production and capacity expansion in line with the expected demand at cost and prices making Indian steel internationally competitive. The present chapter specially deals with the policy measures initiated by the Government with the view to make this sector more productive and competitive.

OBJECTIVES OF THE STUDY
❖ To understand the structure of the large, medium and small scale industries of India.
❖ To estimate the growth of the Indian steel industry.
❖ To provide suggestions based on the issues identified.

SOURCE OF DATA

From the official sources it is found that there are totally 279 steel industries with a distribution of 48 large and 231 medium and small scale industries are getting operated in India. However, for the purpose of collecting a reliable secondary data, the researcher could identify that there are only 15 large scale industries and 19 medium and small scale industries listed in Bombay Stock Exchange and National Stock Exchange. Hence, the study is confined to these 15 large scale and 19 medium and small scale industries.

The required secondary data were collected from Capital line Database and the Annual Reports of BSE, the Annual Reports of Steel, Ministry of Steel, the annual Reports of 'Corporate Sector', 'Capital Markets' and 'Market Shares and Size of Industrial Product' published by Centre for Monitoring Indian Economy (CMIE), Annual Survey of Industries, published by Ministry of Industries, Economic survey and the Annual Reports of respective industries under study. The secondary data pertaining to the level of output of the selected firms, number of labours employed, investment made, exports, imports, the data on financial indicators were collected.

REVIEW OF LITERATURE

Majumdar[1] studied the pattern of productivity growth of Indian Industrial sector since 1950s. The study empirically proved the positive impact of liberalisation measures on productivity. The reforms process was not exacerbated entry threats for the sitting incumbents in Indian industry, but the environment was equally competitive for the new entrants. Attainment of efficiency was a key survival criterion in such situations and the Indian firms had so far yielded positive efficiency out comes. The adoption of technological and organisational innovations had a very large impact on productivity at the firm level. The policy changes that took place in India in the 1990s did significantly enhance potential opportunities on one hand and increase the uncertainties and ambiguities levels on the other.

Romer[2] suggested that the technological change has been an important factor to contribute output growth. Technological change arises in large part because of intentional actions taken by people who respond to market incentives and hence the technical change happens more to be endogenous rather than exogenous. In his study, he concluded that the stock of human capital (levels of education and experience) accelerated the growth but the growth did not depend on total size of labour force or the population. He found that international trade facilitates free flow of new ideas and technologies and reduces the idea-gap, which was a major source of spillovers and growth. Most of the new ideas and technologies were developed in developed countries and trade with them helped in realising these dynamic gains to promote productivity. He further found that the use of non-rivalry nature (use of a blue print of a technology or new idea by one agent does not preclude use by other agents) of technological change was a source of increasing returns to scale and sustained long run growth.

Athreya and Kapur[3] studied the linkage between the policy towards foreign capital and its contribution to the Indian economy. They also explained the long run conduct and performance of foreign controlled firms relative to domestic firms. In 1950s, the Indian government, in order to achieve the plan targets, allowed foreign equity participation to meet the foreign exchange needs of investment projects. In 1960s, the selectivity of government policy changed the pattern of foreign capital towards manufacturing and technology intensive industries. In 1970s, the intervention of FERA to dilute the 40 per cent of foreign equity and the exception of 'technology intensive' export intensive and core sector, proved more hostile to new foreign investment than the existing foreign affiliates. In 1980s, the policies of India were softened to attract foreign investment but there was only a slight increase and most part, Indian industry came to rely on foreign debt capital to meet its foreign exchange needs. The enormous increase in FDI was realised only in 1990s when India agreed to implement the reform

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measures in tune with IMF. The study found that the advertising intensity was greater for foreign controlled firms while expenditure on technology imports was greater for domestic firms. Export intensity was quite similar for both the firms. Technology inflows could also improve the productivity of domestic firms through spillovers as better productions and management techniques in the host country.

Goldar and others[4] in their paper studied the effect of ownership on efficiency of engineering firms in India with a comparison of technical efficiency among three groups of firm's viz., firms with foreign ownership, domestically owned private sector firms and public sector firms. The study explained that the foreign ownership firms had greater efficiency than the domestic firms. It was so because, in a developing country, the foreign firms had relatively better access to advanced technology. The study concluded that the foreign firms in Indian engineering sector had greater technical efficiency than that of domestic firms and there was no significant variation in technical efficiency between private and public sector firms. The study pointed out a fact that there were indications of a process of efficiency convergence, that is, the domestic firms tended to 'catch-up' with foreign firms in terms of technical efficiency. Among the various factors responsible for inter firm variation in technical efficiency, the import intensity played a significant role. The liberalization of imports increased the access of firm to imported inputs and capital goods and thus contributed considerably to increase the efficiency of engineering firms.

Nwaokoro[5] examined the impact of the trade restrictions on steel imports in order to protect the US steel industry. During the period of 1963 to 1988, the industry experienced a tremendous decline in its output. Trade restrictions are implemented to limit steel imports. The overall goal of this study is to estimate the impact of the steel trade restriction regimes on the output of the industry. Beside foreign competition, the study addresses the impact of other factors - other shipments (nonsteel shipments) and the prices of steel substitutes - aluminium, and plastic and rubber that may have also caused variation in steel production. The study estimated insignificant regression results which implied that the protection regimes were not statistically significant to enhance output expansion.

- Equity intensives (retained cash flow from operations to tangible net worth)
- Return on investment (profit before depreciation, interest and tax to total tangible assets)
- Sales efficiency (profit after tax to net sales) and

Their study observed a declining trend in profitability in relation to sales shareholders equity and total investment the impact of which increased with the increasing interest burden. It was also found that these 3 groups of ratios of profitability showed a consistent declining trend across most of the firms.

INDIAN STEEL INDUSTRY: AN OVER VIEW OF POLICY MEASURES

The Indian iron and steel sector has been under strict government control for almost the whole period since independence. Government intervention took place in the form of both direct and indirect intervention. After independence in 1947, the government took full control over the iron and steel sector and established a policy of restricting development of new integrated steel plants to the public sector. The policy change was due to sustained shortage of steel in the Indian economy. Prices of different steel products were determined by the government and announced by the Joint Plant Committee (JPC), a body constituted in 1964 under the Iron and Steel Control Order. The distribution policy aimed at ensuring an equitable distribution among end- users and meeting the requirements of the priority sectors like Railways, Defence and Power. From 1972 onwards, due to impeded growth in the steel industry, the government introduced dual pricing in the iron and steel industry. In the new Industrial Policy announced in July 1991 Iron and Steel Industry, among others, was removed from the list of industries reserved for the public sector and also exempted from the provisions of compulsory licensing under the Industries (Development and Regulation) Act, 1951. The import regime for iron and steel has undergone major liberalization moving gradually from a controlled import by way of import licensing, foreign exchange release, canalization and high import tariffs; to total freeing of iron and steel imports from licensing, canalization and lowering of import duty levels. Export of iron and steel items was also freely allowed.

The government of India with a view to make the Indian steel globally competitive and more productivity further eased and intensified the reform process. The major initiative taken by the Government after 2004 include the merger, acquisition, revival and structuring of sick units. The government framed and implemented National Steel Policy in 2005. The long term strategic goal of NSP is that India should have a modern and efficient steel industry of world standards, catering to diversified steel demand. With these policy measures and effective monitoring mechanism, it is worthy to mention that the production of steel in India has greatly improved. The following section will present an empirical evidence of the structural growth in Indian steel industry during the period 1997-98 to 2006-07.

STEEL PRODUCTIONS IN INDIA: A COMPARISON WITH GLOBAL PRODUCTION

At the global level, an increasing trend in the steel production could be noticed in Table 4.1. In 1997-98, the initial period of study, the world production of steel was 799 million tonnes but declined marginally to 777 million tonnes in the year 1998-99. With the steady increase, the global

Production of steel was found at 1244 million tonnes in the year 2006-07, an increase of 445 million tonnes during the study period. The growth of global steel production was also subject to wider fluctuations varying from a negative growth of 2.753 per cent in 1998-99 to a positive growth of 10.206 per cent in 2004-05. The average growth of global steel production was estimated at 5.195 per cent for the period 1997-98 to 2006-07.

The share of India in the world production of steel improved significantly over the period of study. The percentage share of steel production in India in the global production is also presented in Table 4.1.India's share in global steel production was 2.925 per cent in 97-98.

It could be noticed from Table 4.1 that the share of India in the global steel production witnessed a steady increase from 2.925 per cent in 1997-98 to 3.970 per cent in 2006-07, an increase of over one per cent during this period. The share of India declined negligibly from 3.746 per cent in 2004-05 to 3.733 per cent, a marginal fall of 0.013 per cent in 2005-06. The average share of India in the global steel production was estimated at 3.539 per cent during the period 1997-98 to 2006-07.

Therefore, it could be inferred that the steel production in India increases in accordance with global production. While the growth of global steel production was in the range of -2.753 (1998-99 and 10.206 per cent (2004-05), the steel production in India recorded much higher and positive growth in the range of 1.926 per cent (1998-99) and 15.841 per cent (2006-07). Similarly the average growth of steel production in India was also found higher at 8.162 per cent as against 5.195 per cent recorded for the global production of steel. In the same way, there was continuous increase in the share of India in the global production of steel. By applying the trend analysis the steel production in India is estimated 65.338 million tonnes, for the year 2015-16. 1523.261 million Tonnes in the world during the same year.

TABLE: 4.1: TRENDS IN THE PRODUCTION OF STEEL INDUSTRY IN INDIA AND THE GLOBE: A COMPARISON (Million Tonnes)

Sl. No.	Year	India	Growth (%)	World	% Growth	% share in World Production
1.	1997-98	23.37	2.861	799	5.828	2.925
2.	1998-99	23.82	1.926	777	-2.753	3.066
3.	1999-00	26.71	12.133	789	1.544	3.385
4.	2000-01	29.70	11.194	848	7.478	3.502
5.	2001-02	30.63	3.131	850	0.236	3.604
6.	2002-03	33.67	9.925	904	6.353	3.725
7.	2003-04	36.19	7.484	970	7.301	3.731
8.	2004-05	40.05	10.666	1,069	10.206	3.746
9.	2005-06	42.64	6.457	1,142	6.829	3.733
10.	2006-07	49.39	15.841	1,244	8.932	3.970
	Mean	33.617	8.162	939.200	5.195	3.539
	CV	25.301	56.143	17.310	79.680	9.270

Source: Annual Reports, Ministry of Steel, GOI, various issues and World Steel in figures 2007, International Iron and Steel Institute

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TABLE: 4.1.1: TRENDS IN THE PRODUCTION OF STEEL INDUSTRY IN INDIA AND THE GLOBE: A COMPARISON
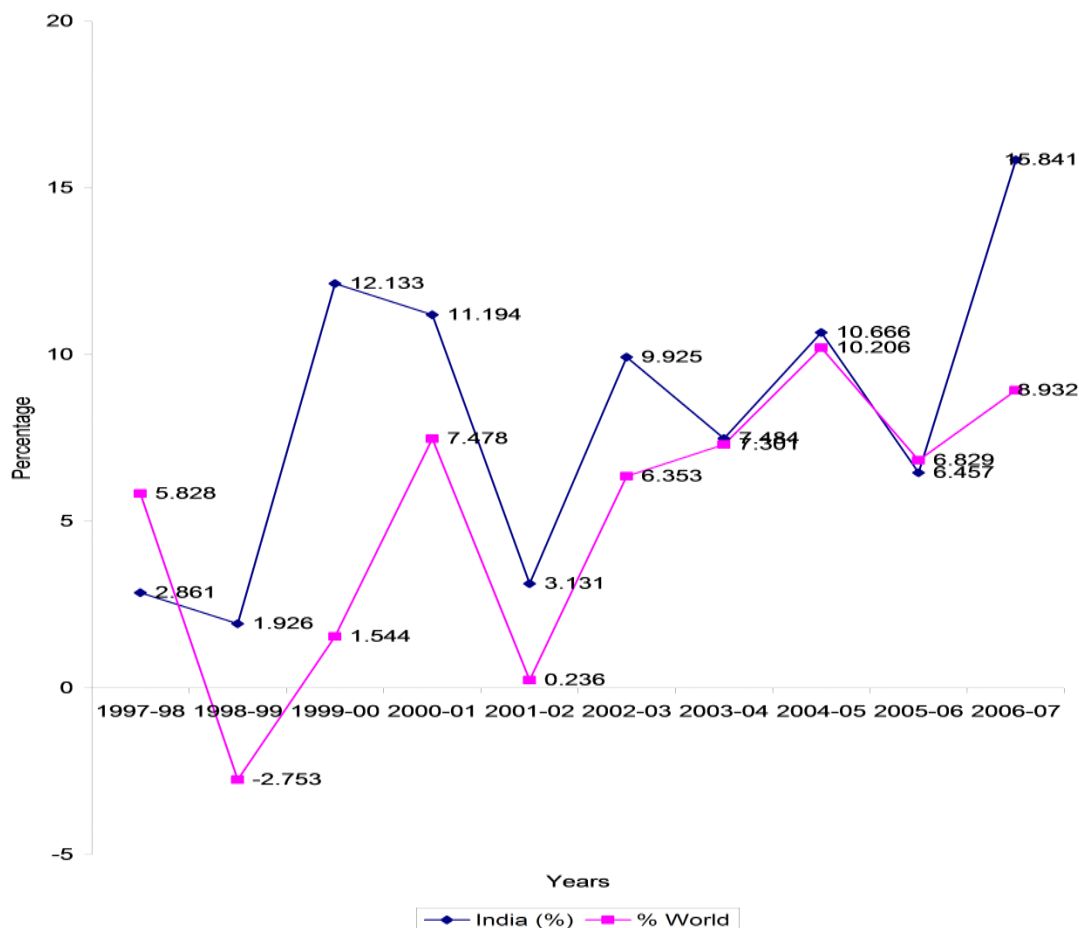
STRUCTURE OF STEEL INDUSTRY IN INDIA

Structural changes in an industry can be better understood by the interrelationship among the variables output, capital and labour. These interrelationships include the estimation of Capital-Output Ratio (K/O), Labour-Output Ratio (L/O) and Capital-Labour Ratio (K/L). Hence ratios among these variables are estimated for the Indian steel industry for the period 1997-98 to 2006-07

CAPITAL-OUTPUT RATIO (K/O)

Capital-Output Ratio is a measure of requirement of capital per unit of output. Theoretically, the ratio is expected to fall over a period of time. The declining trend in the K/O is an indicator of the better performance of the industry. Similarly lower K/O denotes better use of capital as it indicates higher capital efficiency.

TABLE: 4.2: TRENDS IN CAPITAL OUTPUT RATIO OF STEEL INDUSTRIES

Sl. No.	Year	Small Firms	Large Firms	All Firms
1.	1997-98	2.854	3.185	3.148
2.	1998-99	3.141	3.843	3.764
3.	1999-00	3.714	3.671	3.675
4.	2000-01	2.716	3.204	3.151
5.	2001-02	3.369	3.645	3.624
6.	2002-03	3.080	3.000	3.005
7.	2003-04	3.898	2.943	3.002
8.	2004-05	4.293	2.536	2.626
9.	2005-06	4.785	3.192	3.284
10.	2006-07	4.512	2.199	2.296
	Mean Growth	**3.636**	**3.142**	**3.158**
	CV	**19.828**	**16.261**	**14.707**

Source: Estimated based on Capitaline Database

Table 4.2 presents the estimates of the trends in K/O in the Indian steel industry for the period 1997-98 to 2006-07. At the aggregate level, K/O was observed to be at around 3 as the mean value was estimated at 3.158 for the entire industry. This was in the range of 2.296 (2006-07 and 3.764 (1998-99). The annual variation of K/O is on the decline indicating better use of capital in the Indian steel industry.

This declining trend is not applicable to all the firms operating in this industry. When the firm size is considered, there exists heterogeneity in the estimated values of K/O. In the case of small firms, the trend in K/O was found increasing. It was 2.854 in 1997-98 and gradually increased to 4.512 in 2006-07.The mean K/O of small firms was also estimated to be higher (3.636 than the mean K/O of the industry as a whole (3.158). The increasing K/O of small firms means that small firms require more capital to produce one unit of capital than what it was required in the initial period of the study. This is again an indicator of the capital inefficiency in the small firms.

The capital output ratios of the large firms are also estimated and the same has been presented in the Table 4.2. As against the small firms, the large firms in the Indian steel industry experienced declining K/O during the study period. It was estimated at 3.185 in 1997-98 and gradually declined to 2.199 in 2006-07. The mean value of K/O of large firms was also found to be marginally lower (3.142) than the industry average (3.158). Large firms have higher level of production and they could reap the benefits of economies of scale of production. As a consequence they could make better use of capital leading to an increase in the capital efficiency.

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CHART: 4.2.2: TRENDS IN CAPITAL OUTPUT RATIO OF STEEL INDUSTRIES
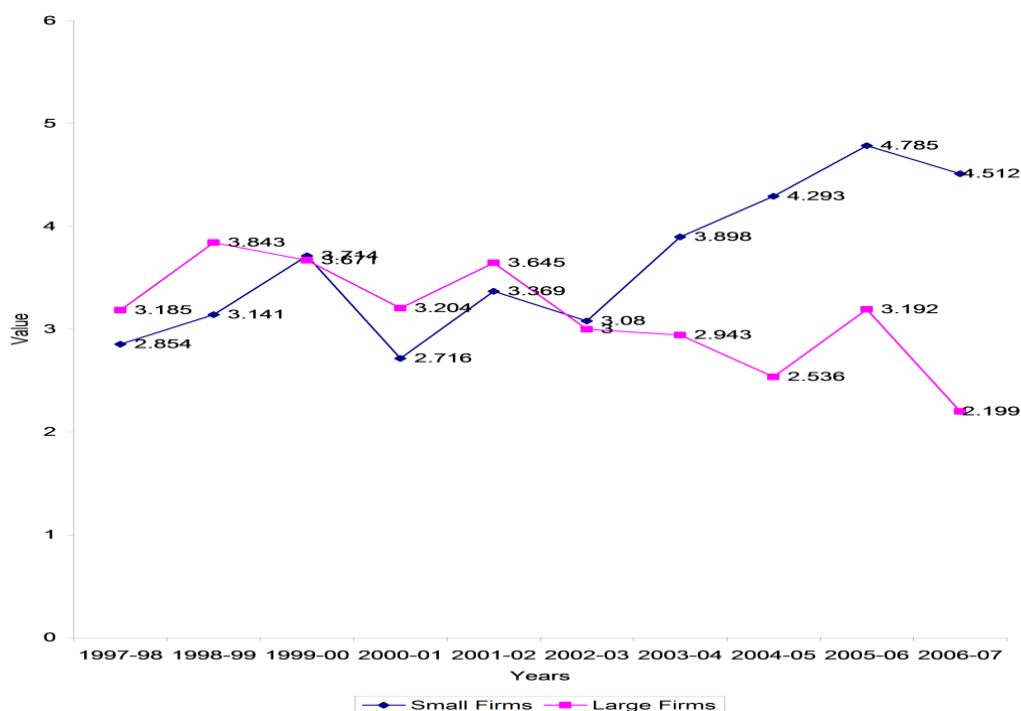
LABOUR-OUTPUT RATIO (L/O)

Labour-Output Ratio (L/O) represents the requirement of number of workers to produce per unit of output. Theoretically, it is expected that, as the industry gains benefits of technical advancements, this L/O is required to decline over the period. The lower and declining L/O is always preferred as it indicates increasing labour efficiency.

Table 4.3 depicts the estimated values of labour-output ratios of Indian steel industry for the small, large and for the entire industry. It could be noticed from the table that the L/O was found declining at the aggregate level. It was 0.364 in 1997-98 and it declined to 0.138 in 2006-07 for the entire industry. Despite this declining trend, the mean value of L/O was estimated at 0.302 for the entire industry for the period 1997-98 to 2006-07

TABLE: 4.3: TRENDS IN LABOUR OUTPUT RATIO OF STEEL INDUSTRIES

Sl. No.	Year	Small Firms	Large Firms	All Firms
1.	1997-98	2.053	0.155	0.364
2.	1998-99	1.980	0.167	0.372
3.	1999-00	2.564	0.209	0.453
4.	2000-01	1.678	0.164	0.330
5.	2001-02	2.691	0.207	0.392
6.	2002-03	2.028	0.179	0.307
7.	2003-04	1.569	0.150	0.238
8.	2004-05	1.594	0.128	0.203
9.	2005-06	1.690	0.132	0.222
10.	2006-07	1.508	0.077	0.138
	Mean Growth	**1.936**	**0.157**	**0.302**
	CV	**21.444**	**24.857**	**32.728**

Source: Estimated based on Capitaline Database

In accordance with the industry both small and large firms have recorded declining L/O during the study period. The L/O was at 2.053 in 1997-98 but declined marginally to 1.508 in 2006-07 for the small firms. In the case of large firms, the decline in the L/O was found significant as it feel from 0.155 in 1997-98 to 0.077 in 2006-07. Between small and large firms, the decline in the L/O was found higher for large firms. Though both the firms recorded declining trend, the mean L/O of the large firms was comparatively lower (0.157) than the small firms (1.936) and also lower than the industry average (0.302). The continuous decline in the estimates of L/O indicates increasing labour efficiency in this industry and the increasing labour efficiency was higher for the large firms compared to small firms operating in Indian steel industry.

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CHART: 4.3.3: TRENDS IN LABOUR OUTPUT RATIO OF STEEL INDUSTRIES
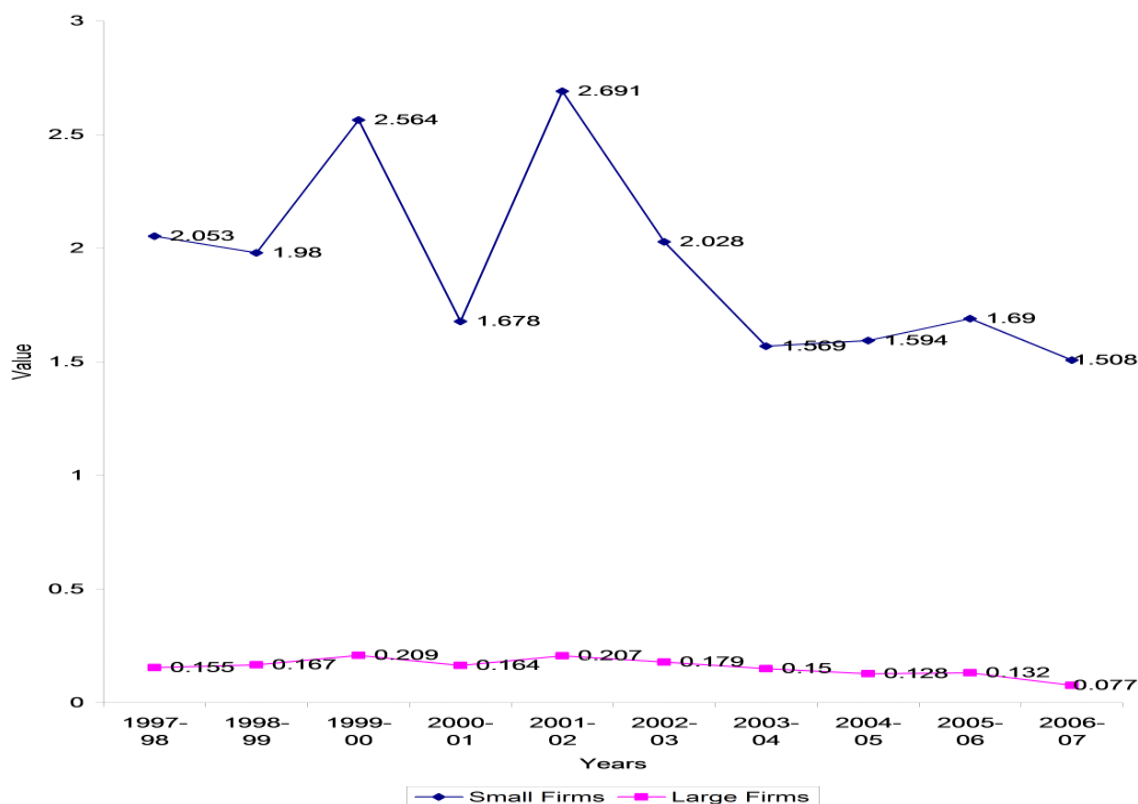
CAPITAL-LABOUR RATIO (K/L)

Capital-Labour Ratio is a measure of availability of capital per unit of labour. Theoretically, as against capita-output (K/O) and labour-output ratio (L/O), capital-labour (K/L) is expected to increase over time. The technological advancements would result in higher investments in the industry leading to more availability of capital per unit of labour. Growth theories also postulate that higher K/L will result in lower L/O leading to an increase in labour efficiency. Table 4.4 presents the estimates of K/L for the period 1997-98 to 2006-07 for the small and large firms in the Indian steel industry.

TABLE: 4.4: TRENDS IN CAPITAL LABOUR RATIO OF STEEL INDUSTRIES

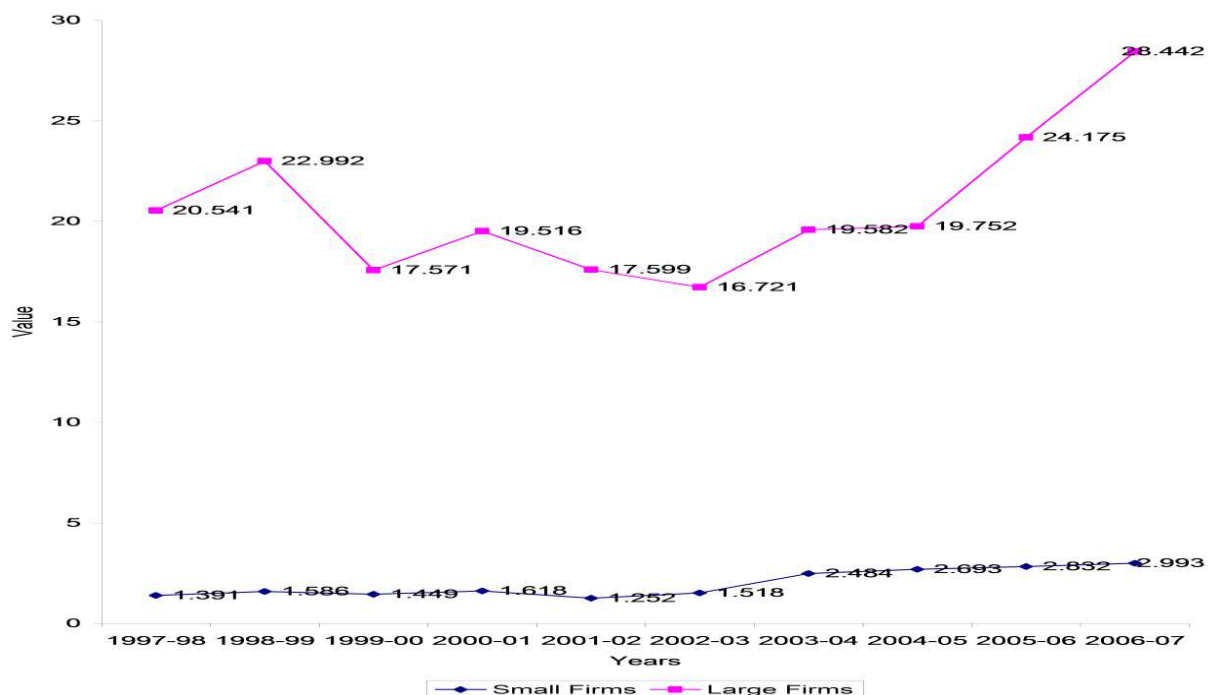| Sl. No.	Years	Small Firms	Large Firms	All Firms
1.	1997-98	1.391	20.541	8.638
2.	1998-99	1.586	22.992	10.112
3.	1999-00	1.449	17.571	8.107
4.	2000-01	1.618	19.516	9.545
5.	2001-02	1.252	17.599	9.256
6.	2002-03	1.518	16.721	9.793
7.	2003-04	2.484	19.582	12.624
8.	2004-05	2.693	19.752	12.909
9.	2005-06	2.832	24.175	14.815
10.	2006-07	2.993	28.442	16.679
	Mean Growth	1.981	20.689	11.248
	CV	34.362	17.359	25.464

Source: Estimates based on Capitalize Database

The mean K/L for the entire industry was estimated at 11.248 during the study period. It was in the range of 8.638 in 1997-98 and 16.679 in 2006-07. It could be noticed from the table-4.4 that the K/L in the industry doubled from 8.638 to 16.679 over the period of study under consideration. This increasing trend in the K/L was observed both in small and large firms but differ in magnitude. In the case of small firms the K/L was found increasing from 1.391 in 1997-98 to 2.993 in 2006-07. The annual change in K/L of small firms was steady particularly after 2001-02. With the varying annual changes, the mean K/L of small firms was estimated at 1.981 during the period of study.

The capital-lab our ratio (K/L) of large firms showed a remarkable level when compared with small firms. The mean K/L of large firms was estimated at 20.689. It was almost 10 times higher than that of small firms and doubled that of entire industry. The change in K/L was mixed till 2002-03 and then onwards there was continuous increase in the K/L of large firms. The K/L of large firms increased from 20.541 in 1997-98 to 28.442 in 206-07 with the least rate recorded at 16.721 in 2002-03.

Large firms, in general, have higher capital base and they are more technically advanced when compared to small firms. Due to increasing growth of capital and declining rate of lab our there was a higher K/L of large firms in the Indian steel industry. From the Table 4.4, it could be noticed that K/L of both small and large firms increased. The K/L of large firms was found to significantly higher than small firms but the increase in K/L was fund higher in small firms as it increased from 1.391 to 2.993, double the increase over the period 1997-98 to 2006-07.

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CHART: 4.4.4: TRENDS IN CAPITAL LABOUR RATIO OF STEEL INDUSTRIES

SUMMARY

Steel industry was the first core sector freed from the government intervention after economic reforms in 1991. The detailed analysis made revealed the structural changes that have taken place during the period 1997-98 to 2006. A brief summary of the analysis has been presented in this section Steel production has increased in accordance with the global production. While the average growth of global steel production was 5.195 per cent, steel production in India increased at an average rate of 8.162 per cent. Similarly, the share of India in the global steel production also increased from 2.925 per cent in 1997-98 to 3.970 per cent in 2006-07.

The interrelationship among the variables, were also estimated in terms of capita-output ratio (K/O), labour-output ratio (L/O) and capital-labour ratio (K/L). The K/O was found declining at the industry level indicating greater capital efficiency. The small firms were found to have higher level of K/O (mean value of 3.636) than the large firms (3.142). The lower K/O of large firms was an indication of higher capital efficiency than that of small firms. The mean L/O was estimated at 0.0302 for the entire industry. There was declining trend in L/O of both small and large firms but the fall was more for large firms than the small firms. This declining trend in L/O is again an indication of higher labour efficiency. Similarly, there was a significant growth in K/L which was almost doubled from 8.638 in 1997-98 to 16.679 in 2006-07 for the entire industry. The increase was common in both small and large firms. While the increase was from 1.391 to 2.993 for the small firms, it was from 20.541 to 28.442 for the large firms. The K/L of large firms was found higher than that of small firms but the rate of increase found greater for the small firms.

A general conclusion that could be made from the analysis is that, in all the measures, there was a significant improvement in the Indian steel industry. Within the industry, the performance of large firms was found to be significantly higher than that of small firms. The small firms may have certain advantages like lower wage rate, but the large firms, due to the benefits of scale of production, could perform much better than the small firms in the Indian steel industry during the period 1997-98 to 2006-07.

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