INDIA'S ENGINEERING EXPORTS: GROWTH, CONCENTRATION AND DIVERSIFICATION

THESIS SUBMITTED TO THE
COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY
FOR THE AWARD OF THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN ECONOMICS
UNDER THE FACULTY OF SOCIAL SCIENCES

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NOVEMBER, 1995.

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CERTIFICATE

Certified that the thesis **"India's Engineering Exports: Growth, Concentration and Diversification"** is the record of bona fide research carried out by **Mr.P.Arunachalam** under my guidance and supervision. The thesis is worth submitting for the degree of Doctor of Philosophy in Economics under the Faculty of Social Sciences.

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DECLARATION

I declare that this thesis is the record of bona fide research work carried out by me under the supervision of Dr.D.Rajasenan, Reader, Department of Applied Economics, Cochin University of Science and Technology, Kochi 682022. I further declare that this thesis has not previously formed the basis of the award of any degree, diploma, associateship, fellowship or other similar title of recognition.

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P. ARUNACHALAM

ACKNOWLEDGEMENT

During the course of my work I have received generous help from many quarters and I acknowledge them all with gratitude.

With boundless gratitude and great respect I express my sincere obligation to Dr.D.Rajasenan, Reader, Department of Applied Economics, Cochin University of Science and Technology, for his expert guidance, vast scholarship, whole-hearted support and constant encouragement, without which this thesis would not have been completed. I consider it a privilege to have been able to work under his supervision and guidance.

No few words can express my profound gratitude for the sincere, invaluable and priceless help, guidance and suggestions which I have availed from Dr.K.C.Sankaranarayanan, Professor and Head, Department of Applied Economics, Cochin University of Science and Technology. These lines are at best written short to convey my great respect to the true dedication shown by him. I shall remain beholden for his scholarly counsel. I deem it a great privilege to have been associated with him.

I express my sincere gratitude to Dr.M.K.Sukumaran Nair, Reader; Dr.M.Meera Bai, Lecturer, Department of Applied Economics; Dr.Jose T.Payyappilly, Professor; Dr.Mary Joseph, Lecturer, School of Management Studies, Cochin University of Science and Technology and the late Dr.C.Radhakrishnan, Reader in Econometrics, University of Kerala, for the timely encouragement given to me.

I extend my sincere thanks to Shri P.K.Shah, Chairman, Engineering Export Promotion Council, Calcutta, Shri P.Natarajan, Deputy Regional Manager, Shri P.Ramalingam, Public Relations Officer and Office staff, Engineering Export Promotion Council, Regional Centre, Madras; Shri J.K.Kar, Deputy Director General for Directorate General of Commercial Intelligence and Statistics, Calcutta, with whom I had enlightening discussions, for their help, encouragement and valuable suggestions.

I am also thankful to Rev.Fr.Dr. Laynod, Head, Dr.Vincent Jagakumar, Selection Grade Lecturer, Department of Economics, Loyola College, Madras; Thiru S.Muthusamy, Vice-Principal, Shri M.Arokyasamy, Head, Department of Economics, St.Xavier's College, Palayamkottai for their kind help and encouragement.

I also extend my sense of gratitude to Dr.K.V.Raju, Lecturer in Economics, S.H.College, Thevara, Dr.Baby Thomas, Lecturer, Deva Matha College, Kuravilangadu, with whom I had the opportunity to discuss the subject at different levels.

My heartful thanks are also due to the Librarians and other staffs of Centre for Development Studies, Trivandrum; Kerala University Library, Trivandrum; Madras University Library, Madras; Indian Institute of Management, Ahmedabad; Sardar Patel Institute for Social and Economic Change, Ahmedabad, and School of Management Library, Cochin University of Science and Technology.

My thanks are also due to Miss Elizabeth Abraham, Librarian, Smt.V.Alamma, Smt.K.K.Ambika, Mr.C.B.Unnikrishnan and Shri C.V.George, office staffs, Department of Applied Economics, Cochin University of Science and Technology for their profound help and assistance.

I am also thankful to Mr.K.P.Sibiraj for having done the typing neatly and elegantly.

Above all, I praise and thank God for His infinite blessings showered on me in abundance as I worked towards the completion of the thesis.

P. Arunachalam

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CHAPTER I

INTRODUCTION

The need for earning foreign exchange was of paramount importance for India after independence. This was for the mobilisation of the gigantic task of economic growth and industrialisation she initiated under the Five Year Plans. Economic growth is fundamental to economic development.[1] Without generating greater output and income, a country cannot make a sustained attack on poverty, unemployment and other social and economic problems. "While industrialisation is viewed as an essential stage in reaching the goal of rapid economic growth, foreign trade contributes a lot to the economic welfare of people and the development of resources and that of the country itself" (Singh and Sanjay Kumar Singh, 1990). But a narrow industrial production base as well as lack of definite and clear-cut policy framework acted as the major constraints during the first two plan periods in augmenting the country's export earnings.

With average annual exports amounting to Rs.609 crore and Rs.624 crore during the First and Second Plan

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1. International Bank for Reconstruction and Development, World Development Report, 1987, p.78.

periods respectively, the growth rate at 1.0 per cent and 2.2 per cent was abysmally low. Major proportion of exports about 85 per cent was made up of traditional and primary products such as tea, jute, textiles, hides and skins, cotton, spices and tobacco. The first three commodities represented nearly 52 per cent share of the total foreign exchange earnings during this period. On account of limited available resources, efforts were made to strike a balance between imports and exports at a very low level, this undermining the importance of higher inflow of key inputs as well as capital goods for generating a multiplier effect on export production.

Much emphasis was laid on import substitution Policy during the First and Second Plans and it was during the Second Plan the philosophy of developing basic heavy industries[2] was evolved with the help of the inward-oriented strategy of development. Stagnation in India's exports during the 50s necessitated the introduction of export promotion policies along with import substitution as a substitute for the formal parity change (Bhagwath and Srinivasan, 1976).

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2. Government of India, Second Five Year Plan, Planning Commission, New Delhi, p.42.

During the Third Plan period, export production and promotional measures introduced by the government, exercised a positive influence on India's foreign trade. These promotional policies and measures were related to fiscal and financial incentives and included, inter alia, the schemes of Cash Compensatory Support (CCS), import replenishment, duty drawback, supply of key inputs at international prices, availability of pre-shipment and post-shipment finance at concessional rates of interest and freight subsidies. Besides, the institutional service support for export development and expansion was strengthened by reorganising the then existing setup or creating new organisations including the national level state sector commercial corporations, network of commodity specialisation agencies such as commodity boards and export promotion councils, service institutions and export houses/trading houses. The institution of Market Development Fund (MDF), now known as Market Development Assistance (MDA), under the Ministry of Commerce was another step for exploring and exploiting new markets through overseas surveys, participation in trade fairs and exhibitions, publicity abroad, and trade delegations.

The cumulative effect of the promotional schemes and export production measures introduced during the Third

Plan broke the stagnancy that had marked by the country's export performance during the first two Plan periods.

When the exports reached a take-off stage during the Third Plan, an important development, namely, devaluation of the Indian rupee, took place on 6th June, 1966. On the premise that Indian exports would become cheaper in world markets as a result of devaluation, all the incentive schemes aimed at imparting competitiveness to wide ranging export products were withdrawn. This had a deleterious effect on exports which, contrary to expectations, tended to decline. The position was further aggravated by drought conditions and poor harvests during the successive two years starting from 1965-66.

The three Annual Plans that followed the Third Five Year Plan witnessed not only a dismal export performance but also a widening trade deficit, three year average deficit amounting to Rs.744 crore. Notwithstanding the none too encouraging export performance, the economy learnt useful lessons from the trials, adjustments and errors of the first eighteen years of the planning era.

India's exports, achieved a major breakthrough in the Fourth Plan period, after the government approved the

Export Policy Resolution, 1970. Among the national priorities, export sector was accorded the third place, next to food and defence. The 1970 Policy Resolution provided a broad framework and guidelines for various sectors of the Indian economy as well as the public and private sector agencies, both at the centre and in the states. Upon realisation that there was a close nexus between exports and imports, the country's import policy was liberalised for generating greater export production.

Further, the incidental procedural and documentation formalities were simplified to render the task of export development and expenasion less complicated for exporting community. The institutional service support was also further strengthened and geared to meet the export promotion needs of different sectors and overseas markets.

The congenial international economic and trading environment as well as good harvests at home provided added impetus to country's export efforts. The early seventies witnessed a commodity boom in the world markets leading to an overall trade expansion. New development, particularly the introduction of the Generalised System of Preferences (GSP) under the aegis of UNCTAD and emergence of new markets like Bangladesh and countries in West Asia and the

Gulf constituted other factors responsible for a big leap in foreign trade during the Fourth Plan. Besides, attainment of the goal of self-sufficiency in agricultural production commensurately reduced country's dependence on imports of foodstuffs thereby saving valuable foreign exchange for other developmental activities.

The phase of rapid expansion in exports during the Fourth Plan was followed by energy crisis and two recessions of 1973-74 and 1980-82 which seriously affected global economic and trading environment. The onslaught of these two severe recessions virtually halted the growth of the world economy. The second recession of 1980-82 was more serious and most of the countries either witnessed a negative or stagnant growth. The net outcome, particularly in the tardy eighties was a dismal growth rate of 0.9 per cent in the developed countries and 1.4 per cent in the developing nations.

The inflationary and recessionary trends in international markets and intensified protectionism by the industrialised countries had a telling effect on India's exports too. An expensive oil import bill on the one hand and inflow of high value capital goods and machinery for modernisation and quality upgradation of manufactured products on the other inflated expenditure on imports of these products. During eighties, 80 per cent of the country's export earnings were consumed by oil imports. About 50 per cent of the total imports were represented by a single item, i.e. petroleum and petroleum products.

The trade deficit tended to move upward and annual average exports from India amounting to Rs.4,441 crore and imports at Rs.5,147 crore during the Fifth Plan, left a trade gap of Rs.706 crore. The deficit further widened to Rs.5,643 crore in the Sixth Plan whend average exports and imports stood at Rs.8,904 crore and Rs.14,547 crore respectively.

The depressed international economic and trading environment, a difficult balance of payments position and the dwindling foreign exchange reserves of the country continued to pose a serious challenge to the export promotion efforts of India. To meet these challenges effectively, a multi-pronged and multi-faceted approach has been adopted in recent years in the form of innovative measures encompassing policy framework, institutional service support, export incentives and new or non-traditional tools of export expansion.

As a result of such promotional efforts, there has been a dramatic improvement in India's export performance since 1991. A positive feature of India's exports during recent years relates to its impressive growth rate, diversified product profile and broad-based destination pattern. The diversification in commodity composition of exports is progressing at an alarming rate. Exports of low value commodities or semi-manufactures are being replaced by high value or new and non-traditional products (see Tables 1.1 and 1.2). A significant share of foreign exchange earnings currently accrues from items like gems and jewellery, engineering goods, readymade garments, leather and leather manufacturers, marine products and chemicals and allied products. In 1990-91, gems and jewellery, readymade garments and engineering goods were the top three groups contributing 16.1 per cent, 12.52 per cent and 11.9 per cent respectively in the total exports (see Table 1.3) from the country.

Without in any way minimising the importance of diversification in terms of export products, the Government of India has recognised the need for a selective approach to export promotion efforts. Fourteen thrust sectors have been identified by the Ministry of Commerce for concerted export promotion efforts. The engineering goods exports

Table 1.1: Major Traditional and Non-Traditional Exports of India

(Rs. in crores)

Major Traditional Exports	1970-71	1980-81	1990-91
(1)	(2)	(3)	(4)
Jute textiles	190	330	298
Tea	148	426	1,070
Cotton fabrics	97	276	2,100
Cashew	52	141	446
Oil cakes	55	125	608
Tobacco	31	141	262
Spices	39	111	234
Coffee	25	214	252
Total I	637	1,764	5,270

(contd...)

Table 1.1 contd.

(1)	(2)	(3)	(4)
Engineering	126	815	3,876
Iron ore	117	303	1,049
Iron and steel	91	12	
Readymade garments	30	378	4,012
Leather/leather manufacture	87	403	2,566
Marine products	31	217	960
Gem and jewellery	42	602	5,240
Chemicals	36	225	2,334
Sugar	29	36	
Total II	587	2,991	20,037
Total III (All other items)	309	1,956	7,246
Grand Total	1,535	6,711	32,553

Source: Balagopal T.A.S. (1992), Export Management, Himalaya Publishing House, New Delhi, p.17.

Table 1.2: Major Traditional and Non-Traditional Percentage of Exports

Item	1970-71	1980-81	1990-91
Major traditional products	42	26	16
Major non-traditional products	38	44	62

Source: Balagopal T.A.S. (1992), Export Management, Himalaya Publishing House, New Delhi, p.18.

sector is one of the important sectors among them. Now we can see that the change in composition and identification of selected items indicates that the "manufactures", particularly "engineering goods" taking a high proportion of our exports.

Table 1.1 presents information regarding major traditional and non-traditional items of exports from India.

Tables 1.1, 1.2 and 1.3 reveal that India's exports are getting more preponderant with manufactured commodities than primary products or the trend is diversification of export trade from primary to manufactured commodities. In the results obtained on the basis of percentage shares the trend indicated was the changing pattern of exports of India, i.e., a shift from primary to manufactured commodities. Hence, "a sound and long term export strategy is to be adopted with firm determination to achieve a steady and constant rate of growth by putting non-traditional goods on a stable footing".[3] The fact that the non-traditional goods have established themselves in the markets of even the most

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3. The Hindu (1989), August 1, p.8.

Table 1.3: Composition of Exports

1965-66	% of total exports	1990-91	% of total exports
1. Jute manufacturers	22.6	Gem and Jewellery	16.10
2. Tea	14.2	Readymade garments	12.32
3. Cotton Mill Textiles	5.8	Engineering goods	11.90
4. Iron ore	5.2	Leather and products	7.88
5. Oil cake	4.3	Chemical and pharmaceutical	7.16
6. Engineering goods	4.1	Tea	3.26
7. Leather and products	3.5	Iron ore	3.22
8. Cashew kernels	3.1	Marine products	2.94
9. Crude materials	2.9	Cotton	2.59
10. Spices	2.8	Oil cake	1.86

Source: Balagopal T.A.S. (1992), Export Management, Himalaya Publishing House, New Delhi, p.18.

advanced countries, shows that they would continue to be part of India's exports in the years to come (Ruddar Dutt and Sundaram, 1989).

The analysis reveals that over the years India's export has achieved not only a substantial growth in overall performance but also a remarkable degree of structural change. This transformation of and diversification in commodity composition of export trade can be attributed to deliberate and purposive policies, back up institutional service support and sustained efforts, concomitant with a broad based supply source, industrial capabilities and competitive strength acquired by various manufacturing and processing sectors (Verma, 1988).

Significance of Engineering Exports

A careful look at the data indicates that the composition of India's exports has undergone significant changes since independence. Upto sixties, India was selling overseas more quantities of traditional items like tea, coffee and cotton textiles. But by late 1960s India's exports became more diversified both in terms of commodity composition and geographic destination. This change in the export pattern is partly due to the industrialisation strategy adopted during the Second Plan period. Through a process of evolution, the import substitution phase has led to a vigorous export promotion policy which subsequently led to the diversification of exports from primary commodities to manufactures.

One significant development in this direction is the emergence of engineering goods as an important element in the non-traditional exports of the country (Tables 1.1, 1.2 and 1.3). In fact, manufacture of products such as diesel engines, motor cars, bicycles, steel pipes and tubes etc., started initially as part of the policy of import substitution. After having become established in those fields, India entered the export market. A heartening development is that the new items of exports mainly consisting of engineering items, inter alia, are fast multiplying and are steadily gaining in importance. Holding its dominant position and higher level of growth in the industrial sector, the Indian engineering industry has recorded a spectacular upsurge on the export front. The crux of the problem is how to make the engineering industry more productive, more efficient and ultimately more competitive, given its role as an engine of growth.

Statement of the Problem

The unprecedented increase in competition as well as protectionism in world markets makes it imperative for a country like India to get much more energetically involved in the export business and make the dictum "export and flourish" a really true proposition, as against a somewhat passive "export and perish" approach followed during the last three and a half decades. At present, India needs to evolve new export strategies to cope with the changing international scenario and to ensure a steady improvement in the otherwise sagging export performance. A search for such strategic measures becomes all the more important in view of the all-out efforts of the government for expanding the country's exports to tide over the crippling balance of payment deficits and to generate necessary foreign exchange to meet the import requirements for accelerating the tempo of economic development.

The present study is an endeavour in this direction. Taking engineering exports as an example, the study demonstrates alternative ways of understanding indepth export performance analysis and learning lessons for better performance in future.

Engineering exports have emerged as the most dynamic sector in Indian export profile. A wide range of engineering goods and services are presently exported from India. India's capabilities in the field of capital goods, projects and consultancy services have been recognised overseas. However, the growth of the engineering goods has not been as high as it should be or even as it should be eventhough a prime place has been given for expansion of engineering goods exports. The impressive record of growth of engineering exports may be at the national level only. India's engineering exports' share in world engineering exports has remained minicule (Table 1.4). Over the period from 1974 to 1991, our share has ranged between 0.10 to 0.20 per cent and the share of engineering exports to the engineering production is barely 5 per cent only (see Table 1.5).

Under the circumstances the rising deficit in India's foreign trade cannot be allowed to continue at current levels as it is bound to fuel inflation and increase debt repayments to an unmanageable level. The unavoidable rise in imports of technology and sophisticated requirements is keeping in view with the government policy of encouraging modernisation of industry in order to stimulate economic growth in general and exports in particular. The strategies to be adopted by the planning experts to bring a quantum jump in India's engineering

Table 1.4: India's Share in World Exports of Engineering Products

Years	India's engineering exports percentage share in world engineering exports
1972	0.12
1973	0.10
1974	0.11
1975	0.17
1976	0.17
1977	0.20
1978	0.19
1979	0.19
1980-81	0.19
1986-87	0.11
1987-88	0.11
1988-89	0.15
1989-90	0.17
1990-91	0.17

Source: 1. Balagopal T.A.S. (1992), Export Management, Himalaya Publishing House, New Delhi, p.29.
2. Handbook of Export Statistics, 1979-80, (1981), EEPC, Calcutta.
3. Financial Express (1991), May 18, Bomaby, p.9.

Table 1.5: Share of Engineering Exports in Total Engineering Production

Years	Engineering exports as percentage of engineering production
1970-71	3.3
1973-74	3.2
1974-75	4.4
1975-76	4.4
1976-77	5.2
1977-78	5.5
1978-79	5.3
1979-80	4.4
1980-81	4.3
1981-82	4.3
1982-83	3.6
1983-84	3.5
1984-85	3.4
1985-86	2.9
1986-87	--
1987-88	--
1988-89	2.9
1989-90	3.7
1990-91	4.5
1991-92	5.1

Source: 1. Paul S. (1992), India's Exports, Commonwealth Publishers, New Delhi, p.408.
2. Annual Survey of Industries (Various issues), CSO.
3. Govt. of India, Ministry of Commerce, Annual Reports (Various years).

exports (as these are the high value added items fetching more foreign exchange) would be watched with great enthusiasm. Hence this is an important implication of the study.

Table 1.4 presents information regarding India's percentage share in world engineering exports.

Review of Literature

The literature available in the area of Engineering Exports includes papers presented and published by individuals and a few reports prepared by various scholars and government, quasi-government and private institutions. Here an attempt is made to review the available literature and to organise them in a chronological order. For the purpose of convenience, the studies are classified into three groups. They are: (i) Studies relating to India's General Exports before 1962, (ii) Studies relating to India's General Exports after 1962 and (iii) Studies relating to the Engineering Exports in particular.

(i) Review of Studies Relating to India's General Exports before 1962

During the first decade of Economic Planning, the foreign trade policy of the Government of India was putting more emphasis on the import policy. The import policy traversed from the state of progressive liberalisation (during the First Five Year Plan) to a state of tightening import controls (during Second Five Year Plan). On the export front no specific policy was followed by the government. Keeping this fact in view the following studies are made to examine the trends in India's foreign trade during 1950s.

The long term trends in India's exports were examined by Patel (1959) who projects a gloomy picture of the traditional exports. This, according to him, is largely due to the world demand for the traditional products. There is no systematic attempt to evolve an export policy. This is disputed by Krueger, Cohen and Manmohan Singh.

Krueger (1961) argues that policies of the government and factors of internal demand and supply would explain this stagnation in India's exports. She mentions that a small segment of the export sector is dynamic.

On the other hand, Benjamin Cohen (1964) argues that the stagnation is largely due to the high Domestic Production Cost (DPC) and rising domestic demand, which resulted in relatively higher prices for Indian goods in the foreign markets. Hence, the fall in the competitiveness of Indian exports lead to a fall in the share of Indian traditional exports in the total world exports. Further, the Indian export policy is in conflict with some of the tax domestic economic policies rendering export promotion measures futile. He suggests the formation of an integrated strategy for export promotion.

Manmohan Singh (1964) isolates the external and internal factors that affect India's exports. He argues that multiplicity of factors influence the exports. This is because of the fact that different commodities face different conditions of demand and supply in the domestic and world markets.

Halder (1976) states that India's failure in its export performance is largely due to its inability to compete successfully in a highly competitive world market.

(ii) Review of Studies Relating to India's General Exports after 1962

There is a major breakthrough in the government's trade policy after 1962. Export promotion has been given more importance in India's trade policy and export subsidisation began to offset the effects of over valuation of exchange rate. With the growing realisation that the export subsidies and tariffs are inadequate and inefficient, the government devalued the rupee. This is followed by withdrawal of subsidisation, levy of duties on traditional exports and a liberal import policy. However, export subsidisation is revived and intensified again and changes are made in the import policy to complement to export promotion afterwards.

The structural changes in the composition of India's trade are attributed to the changes in the government policy since 1962 by some economists and various internal and external factors by some others.

In a study conducted by Shourie (1968) he observes that the devaluation of rupee in 1966 did not show any substantial positive results in exports. According to him the reasons for this are the dislocation of trade, accentuation of inflationary trends, and delayed foreign aid accnouncement. Outbreak of hostilities in West Asia leading to closure of Suez Canal added to the problems of India's exports.

The increase in India's exports is attributed by Staelin (1973) to the growing subsidisation of exports.

However, he is critical of this incentive policy for two reasons:

(1) The policy may fail to promote the best of exports because of the impact of non-economic extraneous considerations of the government. This is sought to be examined by using the concept of Domestic Resource Cost (DRC) and explains how this incentive system does not promote lowest DRC exports.

(2) An alternative policy outlined is considered to be a practical move towards a more rational incentive system. According to him export subsidies should not be uniform but should be differentiated such that the level of export price of each export is adjusted so as to equate the domestic resource cost.

Ragnekar (1975) examines the trends in the fall of primary exports and increase in manufactured exports during the post-devaluation period and he points out that both these are due to the rise in the domestic demand for primary goods which is a consequence of increase in investment in the industrial sector and the rise in per oita and national income.

Deepak Nayyar (1976) examines the declining share of India in the world exports and imputes this to domestic factors and policies. According to him devaluation of rupee in 1966 was a futile exercise because of the operation of the export duties at that time. The phenomenal expansion of the rupee value of exports during 1970-75 is very deceptive. The oil crisis and share increase in the prices of major imports resulted in the deterioration of terms of trade and the solution he suggests is in the form of export diversification from primary to manufactured goods.

Mark Frankenna (1976) examines the export performance of India during 70s and specifies four types of changes. These are: (1) changes in material supply constraints on output as a result of import licensing, (2) changes in domestic demand, (3) changes in productive capacity and (4) changes in exchange rates consequent on devaluation and export subsidisation.

Wadhwa (1977) studies the changing pattern of actual performance since 1951 and major factors including Government export promotion policies. In view of the growing unfavourable situation in the international market he favours the formulation of a long-term export strategy, which should be different from the policies pursued upto that time.

Jindwal (1981) in his study on exports from eastern region finds that the exporters from eastern region have been badly hit by frequent labour problems at Calcutta port. There is a stagnation of operations in Calcutta port for a considerable period during 1979-80. Adequate shipping space to different destinations including west coast of USA is not available there.

Singh (1987) examines the overall export promotion in India: problems and solutions. He says that export promotion is one of the main facets of self-reliance. In fact, the success of our economic development and the bright future of our economy depends upon our export promotion capacity. Economists, academicians and planners are of the opinion that prospects of export promotion are not too bright and import substitution is the more appropriate policy to follow.

In examining India's export performance and some policy options, Srinivasa Rao (1987) finds that the major problems affecting India's exports have been the consequence of India's trade and industrial strategies which had heavily relied upon the favoured import substitution policy. It has consequently penalised the exports. Complete, beneficial and reliable information on relative profitability of the domestic and export production of some goods is not available, and most of the analysis being far too at aggregate level, it is easy to relate many examples of industries failing to cope with the competition in foreign markets due to the high cost and the low quality of the domestically produced commodities. According to him these high costs affect our exports.

In a study on India's export performance during the period 1965-66 to 1976-77, Bhashyam (1988) finds that our export earnings have tremendously gone up. But this has to be viewed in the global perspective. Balancing the anticipated yawning gap is of paramount importance. According to him, a judicious monitoring of the export efforts of the individual firms and an effective support to them in the field of production, finance and marketing should definitely enable our country to create trade surpluses and maintain the centuries old financial reputation of the country.

Paul (1992) has examined the overall export performance of India. According to him we must take a clue from the Newly Industrialised Economies (NIE) and the Association of South East Asian Nations (ASEAN). We must build up new bridges with our Asia-Pacific kins for mutual advantage. Cash-rich and technology-flushed Japan, as also Australia, can become our most prospective regional partners.

Leela (1993) finds that the Indian economy is still vulnerable to external shocks. According to her, despite liberalisation at the policy level, procedures in many areas still remain archaic and cumbersome. Most of the procedures need a thorough review to bring them in line with the emerging economic environment in the international level.

(iii) Studies Concerning Engineering Exports

Discussing the problems and prospect of exports of engineering goods on the basis of their performance during 1955-68 , Patil (1970) maintains that devaluation coupled with compensatory support cannot, by themselves, explain the recent increase in the export of engineering goods. Other factors like underutilisation of capacity and closure of the Suez Canal appeal to have played a significant part. Recessionary trends in domestic demand and the emergence of excess capacity have been responsible to a large extent for the development of an export-oriented outlook.

Similar conclusions are arrived at by Dinesh Trehan (1970) and the study conducted by the Indian Institute of Public Opinion (IIPO, 1975). Trehan explains the spurt in engineering product exports since 1966 in terms of three major developments: (a) Devaluation of the rupee in June 1966, (b) Recession of 1966 and (c) the closure of the Suez Canal. But the IIPO study attributes this to the competitive character of the engineering industry. This, according to them, in turn, is due to the dynamic trends in production and the character of unutilised capacity of the industrial sector in the country.

The study of Wadhwa and Sharma (1975) is a description of trends in growth, concentration and diversification of India's exports of engineering goods during 1956-71 rather than an analysis of their determinants. They, however, list the government policies towards industrialisation in the framework of import substitution and export promotion. This is done for industrial sector in general and engineering goods in particular. Basides many other factors (such as devaluation of the rupee in 1966 and the subsequent intensification of export promotion policies, the closure of the Suez Canal, world wide inflation etc.) have also affected the Indian engineering exports. They also maintain that industrial recession of 1967 in the Indian economy was a blessing in disguise. It created exportable surpluses and aroused export consciousness among producers of engineering products.

In an attempt to explain the influence of liberalisation on export performance, Bhagavati and Srinivasan (1975) estimate export functions for a number of traditional and non-traditional commodity groups including engineering goods for the period 1951-52 to 1969-70. The estimated functions use domestic production, domestic demand and a dummy to capture the effect of devaluation as explanatory variables. The coefficients of all the variables are statistically significant and of the right sign. They establish that the post-devaluation increase in exports of engineering goods is the result of both the increased incentives due to parity change and reintroduction of subsidies. Also the easing of domestic demand pressure owing to fall in real investment, by extending the period of the study to include 1970-71 and by running the regressions for shorter periods, they show that domestic inflation weakened the effect of devaluation on export performance.

Mark Frankena (1975) in a pioneering attempt to study the determinants of export of engineering products from India during 1956-70 analyses the factors that prevented or helped their export performance. The non-availability and high prices of raw materials like steel, non-ferrous metals etc., lack of serious export marketing efforts, etc., have been identified by him as factors inhibiting export growth. The increase in exports and in the ratio of export to production during the period, can be explained primarily by (1) changes that occurred in the Indian economy, especially relaxation of material supply constraints for production, the industrial recession, the changes in export subsidy schemes and devaluation, and (2) the changes that occurred in the world economy, particularly the closure of the Suez Canal in 1967, a sharp rise in the world steel price in 1969-70 and increased development expenditure and import substitution in other developing countries.

Frankena shows that the implicit exchange rates on exports - given by devaluation and the export incentives following devaluation - increase the rupee realisation on exports, but this do not cover the long run average cost of firms. Domestic prices are falling due to falling domestic demand. Expanding capacity and declining domestic demand result in excess capacity and firms with excess capacity turn to exporting to reduce costs. Thus the recession (in domestic demand) is considered as the most important factor affecting export performance.

Deepak Nayyar (1976) attributes the marked improvement in engineering product exports during the period to the following three factors:

(a) The demand boom in West Asia, particularly in the OPEC Countries.

(b) The industrial recession at home which slackened domestic demand and increased supplies of engineering goods available for exports, and

(c) The marked depreciation of the rupee vis-a-vis the currencies of major importing countries coupled with the continued subsidisation programme, both of which improved competitiveness and raised the relative profitability of exports as compared to domestic sales.

In a study, Chawla (1981) finds that the important features of Indian engineering exports in recent years have been the success of our enterprises in securing high value contracts in the field of projects against global competition from well-entrenched multinationals. According to him, in the field of civil engineering, our firms have acquired a world-wide reputation in handling different projects connected with the construction of residential accommodations, schools, offices, university buildings and hospitals.

Stating the role of Engineering Exports Promotion Council (EEPC) in the engineering exports, Sinth (1981) finds that from time to time conferences and workshops are organised by the Council to discuss various issues concerning exports. These are meant primarily to highlight the problems of exports and to the exchange of views among exporters and government officials and to suggest measures to help increase exports.

Shah (1981) states that with an interdisciplinary work force comprising of engineers (who have specialised in mechanical, civil, electrical and chemical fields), metallurgists, economists, architects and designers, the country is fully equipped to provide a total range of consultancy services, from development planning, studies of economic environment, socio-economic surveys and project identification, preparation of project profiles, market research, techno-economic feasibility studies, turn-key assignments and revaluation of plant and equipment. According to him India is fully developed to Technical Consultancy and Civil Engineering Projects.

Shah (1981) again states that from an exporter of traditional goods like jute, tea and textiles, India has emerged as a dynamic exporter of high technology engineering products and turn-key projects, as diverse in size and value as they are in kind and category.

According to him India has reached a level of competence which it is now ready to share with the world. Its engineering capabilities are firmly rooted in its broad technological base. A base which is a unique and successful blend of indigenous research and development infused with foreign technologies carefully adopted to suit the country's industrial climate. This places India in the dual position of being a viable partner of both the developing and developed nations.

Suresh Mehta (1981) in his study of capital goods and project exports in India, reveals that a lot of opportunities exist in the West Asian countries for Indian exporters to expand the exports of capital goods, joint ventures, turn-key projects and management contracts etc. This applies to East Asian countries, African countries like Nigeria, Libya, Algeria, Uganda and to the South-East Asian countries like Indonesia, Malaysia and Singapore etc. According to him the stage of economic development of these countries and the climatic conditions as well as the non-availability of skilled local workers make Indian equipment and Indian management personnel more suitable to the requirement of these countries than the highly mechanised and sophisticated equipments provided by advanced countries.

Vinod Kumar (1981) says that joint ventures are vital to the expansion of engineering exports. Through joint ventures, a new ground has been created in the traditional methods of effecting engineering exports. According to him, the operation of joint ventures, apart from achieving the basic objective of agumenting a country's engineering exports, strikes deeper roots in the mutual economies of two countries.

Studying the prospects of exports to West Asia, Rakesh Sadana (1981) finds that with huge earnings from petroleum and petroleum products, considerable potential has been generated in most of the West Asian countries, for a wide variety of engineering products. Most of these countries have launched programmes of economic development involving huge investments. Such developments have spurted the demand for capital goods and many other machinery items.

Kumar Mahadevan (1981) has stated that the Indian Engineering Industry has taken rapid strides in the field of exports over the last 25 years. The pattern, composition and direction of engineering exports have recorded an enviable and impressive change which is evident from the fact that from a supplier of hardware, India has come upto the level of exporting sophisticated plant and machinery, participating in turn-key projects, civil engineering and construction activities and providing technical know-how and consultancy services. Today, our presence is felt in the four corners of the world.

Reddy (1982) has also made an attempt to bring out the problems of engineering exports in India. He suggests that an indepth area and commodity-wise study will have to be carried out to formulate a realistic export promotion policy.

Krishna (1983) has stated that to achieve a GDP growth of 5.6 per cent annually, exports will have to post a 13.6 per cent volume growth or 15 to 16 per cent growth in dollar terms. This magnitude of growth is also necessary to keep the current account deficit at 1.5 per cent of GDP. According to him to achieve all these things India has to give importance to engineering exports.

Discussing the Foreign Trade and Balance of Payments 1986-87, Adiseshiah (1987) suggests that what is required for increase in exports is not the special incentives and special schemes recommended by the Abid Hussain Committee[4] and being acted upon by the Government. These will create, if successful, only special adhoc

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4. To help develop foreign trade policy, the Abid Hussain Committee sets forth a series of recommendations. It starts soundly by stating, that the external sector is part of the national economy, and since exports are 5.7 per cent of GDP, exports can grow, only as the economy grows. It proceeds to recommend a quantum jump in exports through the usual devices of (a) increased and easy-to-obtain duty drawbacks, (b) enlarged and tax-free Cash Compensatory Scheme (CCS), (c) exempting 50 per cent of export incomes from tax, (d) abolishing

(contd..)

islands of prosperity. But the means of increasing exports are high quality services and timely completion of projects. If these two essentials are assured, project exports will increase.

Shail Singh (1987) examines the incentives and export promotion with special reference to selected engineering goods during the period 1969-80 and 1973-84. She finds that India's engineering exports has not been affected significantly by incentives provided by the government. According to her the share of India's

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(n.4 contd.)

licensing and restrictions on imports of capital goods and technology, which are inputs in export production, and (e) the use of "efficient" import substitution.

The scandalous part of the engineering export scene is that the large units have little or no exports to their credit and that over 60 per cent of the exports in some areas are by small firms. The worst thing is that in all fields, the losses incurred on exports are sought to be recovered by pushing up domestic prices when it ought to be the other way round.

Hence for the expansion of exports so urgently needed in the Eighth Plan, unlike in the late 'seventies' and 'early eighties', (when Indian growth stepped up and growth in industrial countries declined, so that India could expand its exports and contain its imports), today the country will have not only to produce more of its traditional and non-traditional exports, but adapt them to the export markets and sell them there. The key to expanding exports is an efficient and productive production structure.

engineering exports in world's total engineering exports has been falling continuously. It means that growth rate of engineering exports of India is less than that of the world's engineering exports. She concludes that though Indian Government has provided a large number of incentives yet, what is required is their proper implementation.

Salim Andrews (1988) in his analysis, has pointed out that sixties and seventies are the best periods for engineering goods exports. In 1980-81 and 1981-82, the share of engineering goods to total exports is a respectable 13 per cent. But in the subsequent years, there is a virtual stagnation in these exports and by 1987-88 the relative share dropped to 8.6 per cent. Listing some of the many problems that have been responsible for this state of affairs, the Economic Survey of 1986-87 makes the following pertinent observations:

1. Strong domestic demand for the Industry's products;

2. Excessive protection of the domestic industry from outside competition;

3. Failure to modernise at a faster pace;

4. High cost of inputs and raw materials;

5. Inefficient and low productivity; and above all

6. Lack of an export culture in the industry.

Besides, engineering exports have been constrained by adverse idnternational factors such as the slow economic recovery in the Western countries, and the continued debt problems of the developing countries.

For overcoming these difficulties, the government has taken a number of policy decisions such as upward revision of duty drawback rates for a large number of items, supply of raw materials at international prices, simplification of procedures for accrual of benefits etc. Besides these, products which have a high export potential have been identified and attempts have also been made to tap newer markets for our products.

Mehta *et al*. (1988) have discussed in their paper on "India's Foreign Trade: Performance and Challenges of the '90", the following items:

(1) In view of the fact that India's foreign trade has not been very successful during the past 40 years, we must commission a historical review for drawing constructive lessons to pinpoint where the approach has paid dividends and where it has not.

(2) The challenges of the future could be met with confidence and selectivity approach, as has been the case with South Korea.

(3) Exports or foreign trade is a function of the entire economy, so there has to be complete co-ordination between different segments of the Indian economy.

(4) From now onwards, we should discourage protection and encourage competition in our foreign sector.

Shah (1988) observes that over the years, the government has created a general policy framework for increasing exports. This has paid dividends. But now the time has come that we need to pursue a policy of selectivity in exports in view of our limited resources. According to him the government must encourage those exporters in the selected products. It is the developed countries rather than the developing ones which account for 76 per cent of the world imports in engineering goods. For aiming at such markets, the three most important concepts are: (1) concept of quality, (2) concept of volume and (3) concept of codmpetitiveness in terms of price.

Varma (1988) finds that the Engineering Industry has to play a substantial role in not only accelerating the pace of export earnings but also in overcoming the balance of payments pressure and bridging the trade gap. According to him at this juncture when the country is facing the severe balance of payments difficulties, with the broad-based industrial infrastructure and technological capabilities, the engineering industry has to be the hope and strength of our export efforts in the years to come.

The Indian Institute of Foreign Trade (IIFT, 1988) has organised a National Conference on "Foreign Trade in India's Development - Performance and Prospects". The Conference has emphasized four imperatives of export expansion in India: (1) The fact that our exports constitute hardly 4.5 per cent of our GNP points to the tremendous export potentialities that lie ahead. (2) Export growth areas are presently confined to a very few sectors, so an enlargement of our export base is essential for accelerating or even sustaining the growth rate. (3) There is an urgent need to evolve new strategies to overcome the existing and potential protectionist barriers. (4) The export contribution of large houses as a percentage of their turnover has been inadequate, i.e, only about 4 per cent. So there is a need for much greater involvement of large industrial houses in the engineering and other sectors of India's export trade.

Arora (1988) has described the dominant position and higher level of growth in industrial sector and in this engineering industry has recorded a spectacular upsurge on the export front. Unfortunately in the 'eighties', the exports of engineering goods stagnated at Rs.1,000-1,100/- crore. This situation has caused considerable anxiety. It has been discussed even at the level of the cabinet secretariat. The concern for this development is heightened, because the Government of India has recognised the engineering industry as a "Thrust Sector" and earnestly wants it to contribute massively to India's foreign exchange earnings.

He also points out that the export-prospects of Indian engineering goods are fairly good, particularly in view of the fact that India has developed the requisite infrastructure and expertise for production and export of a variety of industrial products. Over the years, we have made substantial changes in sectoral and territorial patterns of our exports which are amply manifested in the structural improvement and increased thrust for technological upgradation carried out in the Indian engineering industry. One will definitely expect some export gains from the liberalised import policy regime.

Navin Chandra Joshi (1989) stresses the need to identify thrust countries and new destinations for exports and a more realistic approach towards exports. There appears to be a growing appreciation on the part of the ASEAN countries to foster trade relations with India. Also, China's booming growth offers infinite possibilities for trading and industrial co-operation between both the countries. In western Europe, promising possibilities are emerging for trade exchanges with the Nordic countries, especially Denmark, Austria and Switzerland. Among the African countries the frontline states are trying to divert their trade away from South Africa. The Sahara region offers opportunities for stimulating exports to that area.

The Export Import Bank of India (1989) in its study on the "Strategy for Promotion of India's Engineering

Exports to European Economic Community (EEC)", emphasises the importance of a selective approach to export promotion and focusses on "thrust products" and "thrust markets".

Lajpathi Rai and Janardana Sastri (1989) find that India is yet to establish herself as a major exporter of engineering goods in the international market. The current world engineering exports is estimated around $750 billion, which is expected to tough $1400 billion by the turn of the century. India's share in this sector is only 0.11 per cent, while that of countries like Taiwan, Hong Kong and South Korea are 1.4, 0.589 and 0.581 respectively. For India, with such an insignificant performance, to attain at least 0.5 per cent share in world engineering exports by the turn of the century, implies export of goods worth $7 billion. Engineering Export Promotion Council (EEPC) has set a target of Rs.8,700 crore to be achieved by 2000 A.D., for engineering goods, projects and services.

Sada Shankar, *et al*. (1990) in their work on exports reveal the importance of engineering exports for future development and consider it as a "thrust industry".

Kannan (1991) examines some of the aspects of Singapore exports. According to him, if one takes the example of Singapore, one will be amazed at its export performance. The main reason for achieving this is its political stability, quality of life, English speaking environment, strong engineering base and the lowest engineering and design and development costs in the world. India has some of these pre-requisites like a strong engineering background. But to achieve a tremendous increase in engineering exports India has to have almost all these features.

A study, conducted by Export World Publications and Services Pvt. Ltd. (1992) has found that to create buffer stock of foreign exchange and to give a boost to industrial growth, we need thousands of exporters who are dedicated to earn foreign exchange. According to this study best quality, best price and timely delivery are the three success pillars of exports. Though India is gifted with the third largest pool of trained engineers and scientists, smaller countries like Taiwan, Singapore, South Korea and Hong Kong etc. export ten to twenty times more than India.

Chary (1992) in his study on Indian exports to Europe observes that Indian exports to the European Economic Community (EEC) countries mainly consists of traditional items. According to him in comparison to the large investments in the engineering and electronics industries in India, its exports of these items are quite low. The exports of engineering items to EEC countries constitute only 0.1 per cent of EEC countries' global imports of these items. Exports of electronic items from India to EEC countries are almost negligible.

The Indian Institute of Public Opinion (IIPO, 1992) from a study of India's capital goods has come with the following potential observations.

The importance of capital goods does not stem from its magnitude alone, but the impact it has on the future industrial as well as economic development. India has attained self-sufficiency rate of 80 per cent approximately. While the domestic capital goods industry continues to supply the bulk of indigenous capital goods demand, imports have increased very rapidly in response to import liberalisation. The capital goods imports is about Rs.10,416 crore or about 25 per cent of the total bill in 1990-91. On the export front, this sector has been a relatively low performer, accounting only for 3.3 per cent of total exports. The actual exports by this sector in 1990-91 aggregated Rs.1,250 crore recording a compound growth rate of 22 per cent over 1984-85, which is significantly higher than all industrial growth rate of 18.5 per cent but marginally lower than engineering exports wherein a growth rate of 22.6 per cent was recorded.

The reason for low performance of some sectors in the export front are:

- Inadequate design and engineering capability.

- Lack of system engineering capability to undertake turn-key projects.

- High costs of raw materials and components.

- Minimum Economies of Scale (MES) not achieved.

In another study in 1993, IIPO finds that the transition from a closed economy with a protected domestic industry to the one exposed to fierce international competition may be the testing time for many of the indigenous industries. According to this study the changeover to the market economy would witness the emergence of a large number of business and foreign trade opportunities. The contribution of the engineering industry is remarkable in view of the typical nature of the country's resource base, skilled manpower and the diversified industrial base.

Dealing with Export Marketing, Francis Cherunilam (1994) states that India's export performance in the last four and a half decades has been far from satisfactory. While discussing various aspects of export marketing in the light of the emerging global and Indian scenario, in the globalising environment, companies - large, medium and small - are striving to boost their exports and many companies which ignored the foreign markets in the past are now serious about them. According to him, companies exports mainly consist of manufacturing items, particularly engineering items.

Asok Mukherjee (1994) while analysing some of the important aspects of foreign trade suggests that the major increase in outflow have been in the case of traditional and agri-products. Machinery and equipment and high technology products and consultancy services still remain the laggards. According to him technology upgradation also help the country to penetrate difficult markets.

Vijayaraghavan (1994) attempts to evaluate the Engineering Industry from 1980-81 to 1987-88 and finds that engineering exports during this period are stagnant around Rs.1,000 crore due to the slow down in world trade and lack of proper marketing efforts from inside.

All these studies are mainly descriptive. A systematic analysis of the growth, concentration and diversification of Engineering Exports has not been attempted by the authors. Here an attempt has been made in this direction and to point out certain features regarding this in India's engineering exports.

Objectives of the Study

In view of the growing importance of the exports of engineering products, it is felt that a systematic analysis of the growth, concentration and diversification of these exports is necessary to suggest a viable strategy of export promotion for policy purposes. Therefore, the study proposes to focus on a detailed analysis of the following aspects.

1. The growth and trends in India's engineering exports.

2. The role played by engineering exports in India's overall exports, Gross National Product (GNP), Net National Product (NNP) and Gross Domestic Product (GDP).

3. The items of engineering exports, and

4. The direction of India's engineering exports from region and country angles.

Methodology

The study is based on secondary data. So far as major statistics on India's engineering exports are concerned, they have been compiled from information made available by the Director General of Commercial Intelligence and Statistics (DGCIS), Calcutta and various issues of Annual publications of the Engineering Export Promotion Council (EEPC), Calcutta. In addition to these, sources of data include data published by Central Statistical Organisation (CSO), Delhi and the Reports of the Five Year Plans and the Planning Commission etc. The period of the study is mostly confined to 24 years from 1970-71 to 1993-94.

Both descriptive and analytical techniques have been used in the course of the study. These techniques have been employed to delineate major trends in India's engineering exports to various regions in the world in a temporal as well as cross-sectional basis. This analysis has been made with the help of various statistical tools and techniques such as relative shares, index numbers, simple correlation and regression etc.

Limitations of the Study

The study gives specific emphasis on the development of export of engineering goods from India. The statistics relating to some items of export and some countries are inadequate. Hence the present study confining to the engineering commodities will give only a sectoral view of the potential and prospects of the engineering exports from India. However, every possible attempt has been made to make the study meaningful. The Engineering Export Promotion Council officers and experts of foreign trade in India have been consulted at every stage of the study.

Scheme of the Study

The thesis is organised under ten chapters. The first chapter provides the introduction. It explains the significance of the study, statement of the problem, objectives etc. It also provides an overview of literature in the area, methodology adopted for the study and limitations of the study.

The second chapter gives a brief review regarding the importance of trade for economic development.

The information regarding global and Indian exports is provided in the third chapter.

The importance of Indian Engineering Industry is dealt with in the fourth chapter.

The fifth chapter deals with the growth of and trends in engineering exports.

The sixth chapter shows major items of engineering exports.

In the seventh chapter a region-wise analysis of engineering exports is given.

A country-wise analysis of engineering exports is shown in chapter eight.

The ninth chapter presents a statistical analysis of concentration and diversification coefficients regarding commodity-wise, region-wise and country-wise changes of engineering exports and problems of and strategies for boosting engineering exports.

The tenth chapter presents the summary and conclusions of the study.

CHAPTER II

IMPORTANCE OF EXPORTS: AN EMPIRICAL FRAMEWORK, INTERNATIONAL TRADE AND ECONOMIC DEVELOPMENT

A nation's economic growth basically depends upon its export and import policy. No specific or hard and fast rules have been recommended for developing an developed countries. To improve the balance of payments and fiscal deficits various countries have adopted a unique feature of promoting their export. In this chapter an attempt is made to analyse the various countries' plan in this aspect with special reference to India.

In the early stages of economic development, a considerable quantum of capital goods, raw materials and knowhow needed for development programmes have to be imported. The quantum of imports depends on the resource allocation and the choice of techniques. However, "the recent historical evidence suggests that generally speaking, imports tend to grow nearly as fast as the growth of income in the developing countries" (Manmohan Singh, 1970). Import demand could be met out of foreign official grants, foreign aid, private capital inflow and exports. Among these sources, grants by foreign countries have been on the decline, and aid not only involves debt servicing obligation but causes economic development to depend on the whims and fancies of foreign governments. The cost of aid is still more if borrowing terms, aid-tying practices and inflationary tendencies are considered. Further, private capital inflow involves repatriatory obligations. As a result the only dependable source of foreign exchange is export revenue. In fact, trade is preferable to aid as it "could evoke dynamic responses to competitive opportunities that would reinforce the growth process, and so be more fruitful in the long-run than aid" (Johnson, 1972).

Exports and Economic Development

The analysis and study of exports as a factor in economic development of a country is not new in economics. Before Adam Smith, the mercantalists, the Romans and the Greeks had stressed the importance of exports. But since the days of Adam Smith and Ricardo a new paradigm has been highlighted in which export becomes the Engine of Economic Growth. Malthus, Mill, Marx and nearly all the stands of neoclassical economists, in one way or the other, have recognised exports as the instrument of change (Tripathy, 1985).

Export sector is considered to be a key and propulsive sector as it can diffuse economic development into other supporting sectors and industries. Professor Haberler lists four major advantages of exports which are as follows: (Haberler, 1959). "(a) It provides material means, viz., capital goods, machinery, and raw semifinished materials, which are indispensable for economic development; (b) It is an important source of technological knowledge, managerial talents and entrepreneurship; (c) It is a transmitter of capital; and (d) It brings an atmosphere of healthy competition by checking monopolies and restrictive trade practices".

There are strong logical and empirical grounds supporting the hypothesis that exports are a key factor in the growth process. There are also grounds for believing that there is a casual relationship between exports and economic growth.[1]

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1. The hypothesis was statistically tested by Emery by estimating multiple correlations and simple least-squares regression equations for a group of 50 countries using data on average rates of growth per capita real GNP of exports, and of earnings on current account during 1956-63. The results showed: (a) that the most significant correlation was between exports and GNP, (b) that for every 2½ per cent increase in exports, per capita real GNP showed a rise of 1 per cent and (c) that this last relationship has a high degree of statistical realiability. See, Emery, R.F., "The Relation of Exports and Economic Growth", KYKLOS 1967, pp.470-85. Annual Survey of Industries, 1978-79, Central Statistical Organisation, Calcutta.

The historical experience of a few advanced nations too has clearly demonstrated how foreign trade can be an "Engine of Growth". Britain is a glaring example whose exports of wood and textiles sparked off development in the nineteenth century (1870-1913). Japan, perhaps, is the next good example where the export sector with "silk" as the leader has been the major propulsive factor in the early stages of development. The proportion of exports to Gross Domestic Product in Japan was as high as 22 per cent during 1914-1917. As some other significant examples of export, leading development could be found in the USA during 1790-1860, in Canada and Switzerland during 1900-1913. The exports of grain was a major factor in the early stage of development of both in USA and in Canada. The labour intensive manufacturing export-led industrialisation in Japan and ASEAN in the last three decades and the oil boom in the OPEC's since 1973 have initiated new interest in this paradigm.

Lenin regarded foreign trade as 'Key Sector' of the national economy. Foreign trade came to play a major part in fulfilling the plans of socialist construction in the USSR turning the country into a leading industrial power within a short period of time.

The Indian Experience

It must be pointed out that adequate attention has not been paid to export planning in India till 1980's. In the first two Plans, estimates of exports were more in the nature of expected earnings rather than of firm targets. No definite programme was chalked out to achieve the desired targets through policy changes.

In the first Plan, India's export earnings remained more or less stagnant. The second Plan's average export value was Rs.614 crore per annum and slightly better than that of the previous one. The result of the second Plan was better than the expected earnings, but this was not because of any conscious planning but as a result of international development and ad hoc changes in policies, resorted to when exports of certain commodities were found stagnating. The slow rate of increase in India's exports in the context of a rise in the world trade during this period reduced India's share in the world exports.

The slow growth rate in exports in the second Plan together with a larger requirement of foreign exchange for development, repayment and servicing of debts caused severe strain on India's balance of payments, and thinking turned slowly towards the need for promotion of exports in the third Plan. It was unhesitatingly admitted by planners during 60's that one of the main drawbacks left in the past was that the programme for exports had not been regarded as an integral part of the country's development effort under the first two Five Year Plans. Export targets were fixed on the basis of special studies on export prospects of selected commodities. Exports, it was recognised, would depend largely upon a number of factors such as exportable surpluses, profitability, cost effectiveness, diversification of exports and co-operation of industry; also on such factors as the fiscal incentives, trading arrangements with other countries, tariff, quotas and other commercial policies of importing countries.

However, no attempt has been made to spell out a coherent export policy or to provide any built-in-devices in the Five Year Plans for the creation of export surpluses. No emphasis was laid on the cost reduction measures that should be taken or on the need for export incentives through fiscal and other policies. There was no definite programme on any aspect of export planning, everything was left vague, undecided and uncertain to be considered from time to time in the light of the actual situation. To meet the scarcity which resulted out of short fall in internal production, generally, either partial or total cut was used to be imposed upon exports. Fiscal incentives for exports called for new thinking as it was not in the tradition of the country's fiscal policy; and industry was indifferent to the export trade because it enjoyed the blessing of a sheltered home market.

It looks India has learnt nothing during 30 years of planning. The fifth Plan too did not pay adequate attention to export planning. Export targets were arrived at commodity-wise and year-wise on the basis of a number of studies made but the strategy for realising the targets has not been spelled out in detail.

Government of India is now of the view that expansion of export earnings is crucial for financing the mobilisation of domestic resources. Export earnings need to be expanded at a high rate to realise the objective of poverty alleviation and attainment of economic self-reliance. Launching a determined and purposive export policy has become inevitable to earn foreign exchange, so vitally required for strengthening the developmental effort. In the late 90's Economists and policy makers have reached a unanimous opinion that in India export sector plays a far more important role in the planned effort than the other sectors of the economy.

From Import Substitution to Export-Led Growth

Rapid industrial development is the most important aspect of economic policy in the developing countries and the need for it cannot be disputed. For the above object the pattern of industrialisation, ie., what type of industries should be developed and under what strategy, has been a subject of controversy and debate. Industrial expansion may be either inward-looking or outward-looking as a strategy of development. In a narrow sense, inward-looking strategy is identified with import substitution and outward-looking with export promotion.

Nearly four decades have elapsed since Prebisch (1959) advocated the premise of import substituting industrialisation in raw-material producing Less Developed Countries (LDC) as most beneficial to the growth of their

Economy. The LDCs tried to break away from traditional international division of labour by adopting the strategy of industrialisation first in Latin America and then in Asia. The diversification of the economy through the process of "growth from within" was to accelerate economic growth and also to overcome the problem of foreign exchange bottlenecks. Now we are told that LDCs must, from the very beginning, orient the economy towards foreign trade if they aim to attain economic maturity.

Import substitution was pursued vigorously in countries like Argentina, Brazil, Chile, Columbia, Mexico, India, Pakistan and Indonesia, but the extend of import substitution varied from country to country. The popular belief was that import substitution was a necessary precondition for the growth of manufactured exports. Moreover, at the early stage of development, the advantage of this policy was that areas of profitable investment opportunities were easily located. This is not only because knowledge of market conditions abroad is still limited, but also because of the readiness of potential buyers to keep open their markets to new manufactured goods of the LDCs is by no means certain.

Hirschman (1958) suggested following motive forces behind import substitution -- "balance of payments difficulties, wars, gradual growth in income and deliberate development policies and much of recent economic history of some rapidly developing LDCs can be written in terms of industrialisation working its way backward from the 'Final touches' stage to domestic production of intermediates and finally basic industrial materials".

For import substitution (IS) strategy, several pre-requisites were required:

> "A country should have substantial amount of imports, and there should be requisite protection for new manufacturing industries that are to produce the goods that take the place of goods formerly brought in from abroad" (Alexander, 1967).

It is easy to reduce imports of goods immediately affected, but it had not been realised then, that this process would lead to increased imports of different types of goods as also inputs. To the extent that the policy was successful in creating higher incomes, more imports were also induced. This sequence of events led to the conclusion that import substitution at one stage of production leads to its being attempted at another and the result is to provide "too much capacity at the final and too little at the intermediate stages of production".

This process led to more imports of various inputs than were earlier anticipated, leading to serious balance of payments problems and under-utilisation of capacity at later stages of production. Over this early period, the existing demand for what were previously foreign consumer goods, was increasingly satisfied through import substitution. After this initial period of industrial growth, the rate of manufacturing adjusted more and more to the relatively slow rhythm of economic activity.

As a result, several of the developing countries, of late, have shifted from inward-looking to outward-looking strategy for economic development and are placing more emphasis on the growth and diversification of exports. Secondary outward-strategy has gained a good deal of support from carefully collected and analysed evidence (Little, Scitovsky and Scott, 1970). It is argued that developing countries have been more inward-looking than comparative advantage would warrant and should now become more outward-looking.

As the case for outward-looking policy is strong on both theoretical and empirical grounds, many countries planning for development have already changed over to outward-looking policies to secure the gains from trade, the inter-temporal gains of export-led development and relaxation of the savings and foreign exchange constraints associated with the inflow of foreign capital. Expansion of export earnings is now regarded as a more effective and integrated part of the development strategy.

In the context of low price and income elasticities for the primary product exports, growing competition from synthetics and pervasive protectionalist tendencies in the developed world, expansion of manufactured exports is desirable for achieving higher rates of economic growth. There is now a general agreement that in the absence of exports of manufactueres, industrialisation, based on import substitution, could be unduly costly in the sense of yielding a very low rate of return on investment. It is also being realised that industrialisation based on import substitution offers only a very limited potential for creating large scale employment opportunities for a growing labour force (Singh, 1971).

The development of an export trade is manufactures has many advantages for low income countries. The following may be considered as important.

1. The possibilities of expanding sales may be greater by specialising in manufactures than in primary products. This is because of the fact that the price and income elasticity factors will, in general, be more favourable to manufactures than to primary products.

2. A developing economy might bring in more stability into her export which would in turn be responsible for the stability of the economy as a whole by specialising in manufactures as their price show relative stability both in times of boom and depression.

3. The spread effect of any export activity which is crucial in its relationship with development will depend on the nature of the export good in question. It depends on

the amount of forward and backward linkages that the export of a commodity is likely to give rise to further local activities. Besides, the strength of the spread effect depends on whether or not export activity introduces new methods of production or new skills that can be applied to other sectors or activities of the economy.

4. The exporter will be contributing to the great national endeavour for the economic development of his country by earning the much needed foreign exchange.

5. Exports can earn a reputation not only for the exporting firm but also for the country.

6. Exports mean much wide area of sales, ie., goods can be sent to any part of the world.

7. Export orders are generally of much larger size than the orders in the home market. Hence the production can be increased to optimum level.

8. Labour-intensive industries producing finished or semi-finished goods in our country have cost advantage over industries in advanced countries.

In view of the available evidence, theoretical and empirical, for export-led growth, India joined other developing countries to opt for an outward looking strategy for development.

CHAPTER III

CHANGING SCENARIO OF WORLD AND INDIAN EXPORTS

The earlier chapter has brought to light the importance of trade and economic development. The purpose of this chapter is to analyse the scenario of the global exports.

Trade is considered as an engine of growth. There are many examples wherein countries have attained rapid economic transformation through increasing their foreign trade volume. For eg. countries such as Japan, Germany and the newly industrialised countries of South East Asia attained rapid economic progress through exports. Seeing the tremendous expansion of trade by the above mentioned economies, all the countries of the world, irrespective of developed or developing, have come out with aggressive strategies for accelerating the pace of trade to provide sustainability to their respective economies.

During the decade of the seventies, the largest growth rate in exports was recorded by South Korea (as high as 23.5 per cent) which certainly was of a surprising nature. Japan comes next to South Korea and its total exports registered an annual growth rate of 9 per cent. China comes next to Japan with a figure of 8.8 per cent. The most revealing fact is that the United States of America had witnessed a growth rate of 7 per cent followed by France, Italy, Germany, Canada and the United Kingdom. Table 3.1 shows trends in the growth rates attained by the major exporting countries in the decade of 70s.

It is evident from Table 3.1 that there has been disparities in regard to export growth rates of major countries of the world. The most surprising feature has been the emergence of South Korea and China as the leading exporters of the world.

The decade of eighties has to tell a different story about the trends and situation with regard to the average annual growth rates of world's major exporting countries.

Between 1980 and 1989, South Korea did maintain its top place among the largest exporting countries in the world. But its growth rate in exports during the decade of eighties have gone down considerably, ie., by 12.5 per cent (from 23.5 per cent to 11.0 per cent). Whereas China has replaced Japan as the second largest exporting country in

Table 3.1: Trends in Annual Growth Rate in per cent of Major Nations (1970-80)

Name of the Country	Average Annual Growth Rate in per cent
USA	7.0
Germany	5.0
Japan	9.0
France	6.9
UK	4.9
Italy	4.7
Canada	2.8
China	8.8
South Korea	23.5

Source: World Development Report (1993).

the world and its growth rate has gone up by 2.5 per cent during the decade of eighties over the decade of seventies.

It is noteworthy that during a period of 10 years ie., from 1980 to 1989 India registered the third largest growth rate in its exports ie., 7.5 per cent which is higher by 3.0 per cent over the figure of seventies. After India comes Canada and her growth rate in exports went upto 6.0 per cent between 1980 and 1989. The most surprising feature of the said analysis is the lower growth rates attained by the United States of America, Germany, Japan, France, United Kingdom and Italy.

Among the industrialised countries Germany did slightly better than USA and Japan. UK has recorded the lowest possible growth rate in its exports (ie., only 3.0 per cent). All these show that highly industrialised countries (G-7) have performed well in the decade of seventies compared to the decade of eighties so far as growth rates in global exports were concerned. Japan's growth rate has declined much as compared to USA and Germany. Table 3.2 reveals the percentage trends in average annual growth rates of world's major exporting countries in the decade of eighties.

Table 3.2: Trends in Average Annual Growth Rate in per cent of World Major Exporting Nations in the Eighties

Name of the country	Average Annual Growth Rate in per cent
USA	4.1
Germany	4.0
Japan	3.9
France	3.8
UK	3.0
Italy	3.6
Canada	6.0
South Korea	11.9
China	11.3
India	7.5

Source: <u>World Development Report</u> (1993).

Export Scenario of Asia during 1980s

In Asia, Hongkong emerged as the largest exporting country during 1980s and it accounted for more than 17 per cent of the total exports of developing countries. Taiwan and Korea followed Hongkong in that order with nearly 17 and 15 per cent respectively. Table 3.3 shows the trends in the relative share of Major Asian nations in the total exports of developing nations in 1980s.

It is evident from Table 3.3 that the lowest share has been that of Indonesia ie., 0.5 per cent, which is considered to be marginal as compared to other Asian economies.

The year 1980 showed a different trend and situation in regard to relative performance of major Asian economies. In 1989, Taiwan replaced Hongkong as the largest exporting country in Asia. While countries like Taiwan, Hongkong, South Korea, Malaysia, Thailand and Indonesia increased their respective shares in the total exports of developing world, India's relative share shrinked from 4.2 per cent in 1980 to 3.3 per cent in 1989. Table 3.3 shows trends in relative performance of major Asian economies in the year 1989.

Table 3.3: Trends in Share of Major Asian Nations in the Total Exports of Developing World in 1980, 1989 and 1990

	Share in per cent		
	1980	1989	1990
Taiwan	16.6	19.9	16.2
Hong Kong	17.1	18.1	19.8
South Korea	14.9	17.7	15.8
Singapore	7.9	7.7	9.8
India	4.2	3.3	3.3
Malaysia	2.3	2.9	4.2
Turkey	0.7	2.7	2.3
Thailand	1.7	2.4	3.8
Indonesia	0.5	1.6	2.4
Pakistan	1.2	1.2	1.1

Source: 1. UNCTAD, Trade and Development Report (1993).
2 World Development Report (1993).

Trends in the 1990s

World exports has witnessing an increasing trend since 1989. In 1989, global exports stood at US $3,614 billion. In 1992, it registered an overall increase of more than 40 per cent, which is certainly of an appreciable nature. Table 3.4 shows trends in global exports between 1989 and 1992.

It is evident that from 1989 to 1992 there has been an appreciable rise in the total world exports. But yearly variations of growth has been of erratic nature.

Trends in Exports of Developed Economies

The Developed nations have been witnessing an increasing trend in their exports during 1989-1992. In the year 1989, total exports of developed nations stood at US $2,150 billion and this figure went upto US $2,650 billion in 1992, recording an overall rise of more than 23 per cent. Table 3.5 indicates the trends in exports of the developed economies between 1989 and 1992.

The tables clarify that the trends in the total exports of the developed countries have been of fluctuatng

Table 3.4: Trends in Global Exports from 1989 to 1992

(In US $ Billion)

Year	World exports	Percent rise over previous year	Per cent rise over 1989
1989	3000	7.1	--
1990	3450	15.0	15.0
1991	3520	2.0	17.3
1992	3614	2.7	43.6

Source: UNCTAD, Trade and Development Report (1993).

Table 3.5: Trends in Exports of Developed World between 1989 to 1992

(In US $ Billion)

Year	World exports	Percent rise over pervious year	Per cent rise over 1992
1989	2150	13.2	--
1990	2400	11.6	11.6
1991	2500	4.2	16.3
1992	2650	6.0	23.0

Source: UNCTAD, Trade and Development Report (1993).

nature. However, the fluctuating trends in the total exports of developed countries are of an alarming nature when it is compared with the trends in global exports.

Trends in Exports of Developing Nations

The total exports of developing countries have been on the rise. But the most surprising feature of the same is that the rate of increase in the total exports of developing countries has been much higher than the rate of increase of both the global exports and of the total exports of developed nations. In 1989, total exports of developing nations stood at US $650 billion and this figure has gone upto $850 billion in 1992, recording an overall increase of nearly 31 per cent. Table 3.6 shows the trends in total exports of the developing world between 1989 and 1992.

Export Scenario of Asia in 1990

In the year 1990, trends and situation in respect of relative performance of major Asian countries have been presenting a different story. During this year Hong Kong again replaced Taiwan as the largest exporting country in Asia. The relative shares of Taiwan, South Korea, Turkey

Table 3.6: Trends in Exports of Developing World between 1989 to 1992

(In US $ Billion)

Year	Total Exports	Per cent rise over previous year	Per cent rise over 1989
1989	650	10.2	--
1990	740	13.8	13.8
1991	790	6.8	21.5
1992	850	7.6	30.8

Source: UNCTAD, Trade and Development Report (1993).

and Pakistan have gone down while that of Hong Kong, Singapore, Malaysia, Thailand and Indonesia have gone up. The relative share of India remained stagnant in the year 1990. Table 3.3 gives a clear picture of the relative shares of the major Asian economies in 1990.

Trends in the Exports of Major Countries in 1991

The recent success of South Korea and China in the global trade have proved the efficacy of technology to be competitive enough in the world market. India, in particular, has to depend more on technologically intensive merchandise if it wants to have an annual export growth rate of nearly 15 per cent in dollar terms. Table 3.7 shows trends in the exports of world's major countries in the year 1991.

It is evident from Table 3.7 that in the year 1991 Germany has emerged as the largest exporting country in the world and accordingly surfaced as the largest trading surplus country in the world. Next to it, comes the United States of America.

Trends in Exports Scenario of Asia in 1992

Asian region has been emerging as one of the leading exporting regions of the world and the performance

Table 3.7: Trends in Major Countries' Exports in the Year 1991

(In US $ Billion)

Country	Total exports
USA	398
Germany	402
Japan	315
France	213
UK	185
Italy	170
Canada	125
South Korea	72
China	73
India	18

Source: UNCTAD, Trade and Development Report (1993).

of Asian dragons or tigers has been of excellent nature. Accordingly, countries such as South Korea, Malaysia, Thailand and Indonesia have increased their relative shares in the total exports of developing countries. Similarly, the relative shares of Hong Kong, Singapore and Taiwan have also increased. India's exporting performance has been poor and as a result its relative share in the total exports of developing nations have gone down. Table 3.8 shows trends in exports of major Asian economies in 1992.

It is amply clear from the data set out in Table 3.8 that East Asian Countries or four dragons or the Newly Industrialised Economies (NIEs) have been dominating the export scenario of Asian region. Thereafter, South East Asian countries have been improving their export performance. But most vital countries of South Asian region namely India and Pakistan have failed in improving their export performance.

Trends in Composition of World Exports in the 1980s

In the decade of nineties, manufactured goods were dominating the world exports composition. Mining comes next to manufacturing and agriculture ranked third. Table 3.9 shows the trends in the relative share of different

Table 3.8: Trends in Exports of Major Economies in 1992

(In US $ Million)

Country	Total exports
Taiwan	48893
Hong Kong	44366
South Korea	43537
Singapore	18793
India	8000
Malaysia	7063
Thailand	5996
Indonesia	3895
Pakistan	2954

Source: UNCTAD, Trade and Development Report (1993).

sectors in the world exports in 1980, 1989 and 1992.

It is very clear from Table 3.9 that there has been no match between the relative share of manufactures and other vital sectors' exports namely mining and agricultural goods. This means that this is the decade of manufactured goods and not of raw materials.

From the year 1989, the domination of manufactures became more prominent. Consequently the relative share of mining and agriculture witnessed a declining trend. Table 3.9 shows the trends in the relative share of different facets of world exports in 1989.

The most noteworthy feature of the analysis under reference has been that while the share of manufactures has increased by nearly 6 per cent between 1980 and 1989 the relative share of mining has gone down by more than 6 per cent. This means, manufactures have gained the share largely at the cost of mining during the period under review. There has also been a marginal decline of one per cent in the relative share of agriculture. All these indicate that the decline in the relative shares have been more alarming with regard to mining to agriculture. This has been due to increasing use of technology in the decade of eighties.

Table 3.9: Trends in Share of Different Sectors in World Exports in 1980, 1989 and 1992

(Share in per cent)

Sector	1980	1989	1992
Agriculture	14.7	13.7	12.2
Mining	21.9	21.9	12.3
Manufactures	54.6	61.2	72.8

Source: GATT, International Trade (1993), Geneva.

Trends in Sectoral Exports in the 1990s

Trends in regard to sectoral contribution in global exports in 1992 have been witnessing a decline in the relative share of mining and agriculture in total world exports. The declining trend has been of an alarming nature in the case of mining while the same is of a marginal nature in the case of agriculture. Table 3.9 shows the relative sectorwise share of total world exports in 1992.

It is very clear from the given Table that in the decade of nineties the domination of manufactures has gone upto nearly 73 per cent of the total world exports. But, mining has been loosing much share in the total global exports during this period.

India's External Sector

India's external sector has failed in sustaining the country's share in the global trade and as a result of that there has been enormous decline in India's share in global trade. During the post independence period, the country's share in the total world trade has steadily shrunk from 2.4 per cent in 1947 to a minuscule 0.54 per cent in 1991. "India is operating the twelfth largest economy of the world in terms of GDP. But its share in world exports in 1991 was 0.54 per cent only" (Thakur, 1991). Table 3.10 shows trends in the steep erosion in India's share in global trade between 1947 and 1991.

Data given in Table 3.11 recalls that between 1947 and 1981 there has been a sharp and substantial decline in the share of India in global trade. From 1951 to 1961 the decline in the share was only marginal. Between 1961 and 1971 the decline was rather sharp and thereafter a marginal decline is seen. This mean that after 1971 the rate of decline in the share of the world trade has been insignificant as compared to the fall between 1961 and 1971.

Table 3.12 presents a comparative picture about the trends in exports of India and trends in world exports in dollar terms for the period 1980-90 as well as for the earlier period 1970-80 and for the total period of the study 1950-90.

It is evident that the total exports of India increased from US $8378 million in 1980 to $17,814 million in 1990, ie., at the rate of 7.37 per cent per annum.

Table 3.10: Trends in the Value of India's Exports and World Exports: 1950-1991

(In percentage)

Year	Share of India in World exports
1950	2.00
1951	2.20
1952	1.80
1953	1.50
1954	1.50
1955	1.50
1956	1.40
1957	1.40
1958	1.30
1959	1.40
1960	1.20
1961	1.20
1962	1.10
1963	1.20
1964	1.20
1965	1.00
1966	0.89
1967	0.84
1968	0.73
1969	0.67
1970	0.64
1971	0.58
1972	0.58

(contd.)

Table 3.10 contd.

Year	Share of India in World exports
1973	0.51
1974	0.47
1975	0.50
1976	0.56
1977	0.55
1978	0.50
1979	0.51
1980	0.42
1981	0.42
1982	0.48
1983	0.48
1984	0.46
1985	0.45
1986	0.43
1987	0.48
1988	0.47
1989	0.53
1990	0.51
1991	0.54

Source: 1. Bhagawati, J.N. and Srinivasan, T.N. (1976), Foreign Trade Regimes and Economic Development, The Macmillan Company of India Ltd., Delhi.
2. UNCTAD, Handbook of International Trade Statistics (Various issues.
3. IMF, International Financial Statistics (Various issues).

Table 3.11: Trends in Share of India in Global Trade between 1947 and 1991

(Value in percentage)

Year	Share in global trade
1947	2.42
1951	1.83
1961	1.47
1971	0.63
1981	0.53
1991	0.54

Source: The Times of India (1994), Sept.27, New Delhi.

Table 3.12: Growth Rates[@] of Exports of India and World

Period	India's Exports	World Exports	Percentage share of India in World Exports
1970-80	15.74*	18.20*	-2.49*
	(19.73)	(18.32)	(3.06)
1980-90	7.37*	5.68*	1.61*
	(5.81)	(5.04)	(3.01)
1950-90	7.13*	11.17*	-4.06
	(19.10)	(33.97)	(17.74)

Note: @ Exponential growth rates.
Figures in brackets represent 't' value.
* significant at 1 per cent level.

World exports increased from $19,79,800 million in 1980 to $33,93,600 million in 1990, ie., at the rate of 5.68 per cent per annum.

Indian Exports contributed to an increase in the relative share of India in world exports from 0.42 per cent in 1980 to 0.51 per cent in 1990, with a peak level of 0.53 per cent in 1989. The growth rate is faster than that of the world exports. It also contributed to the transformation of the negative growth rate of 2.49 per cent per annum of the relative share of India in world exports during the period 1970-80 with a positive growth rate of 1.61 per cent per annum during the period 1980-90 (See Table 3.12).

However, on the whole the dollar value of India's exports increased at a lower rate of 7.13 per cent per annum than the rate of growth of 11.17 per cent per annum of world exports during the four decades period 1950-90. The relative share of India in world exports declined at a rate of 4.06 per cent per annum during the same period. The relative share of India in world exports continues to be less than even one per cent.

Tariff Reform in Developing Countries

India began significant efforts in the direction of trade reform in 1991. Prior to this, high tariffs and severe quantity restrictions, coupled with both export controls and export incentives created a wide variance in incentives across industries.

In recent years about 40 per cent of Central Government revenues were generated through tariffs, and about one third by tariffs above 110 per cent. Despite this, reduction in tariffs have been made since 1991. The maximum tariff has fallen progressively from 400 per cent to 110 per cent by 1992, and to 85 per cent in 1993. Import duties on capital goods dropped from 80 per cent to 55 per cent, and even further for imported capital used by exporting firms. Average tariffs fell between 128 per cent to 94 per cent in nominal terms in 1990 and 1992 with import weighted averages falling from 87 per cent to 64 per cent. During 1993 further cuts were made, lowering the nominal average tariff to 71 per cent, and the import-weighted average to 47 per cent. Dispersion of rates has also been significantly reduced. Further reductions in the levels and range of tariffs were announced in the 1994 budget, as well as a proposal for significant future rationalisation of the system.

Table 3.13: Tariff Reform in Developing Countries - Selected Countries

Country	Pre-reform	Current	Tariff ratio
Bangladesh (1989, 1992)	94.00	50.00	0.53
India (1990, 1993)	128.00	71.00	0.55
Pakistan (1987, 1990)	68.90	64.80	0.94
Sri Lanka (1985, 1992)	31.00	25.00	0.81
China (1986, 1992)	38.00	43.00	1.13
Philippines (1955, 1992)	27.60	24.30	0.88
Indonesia (1985, 1990)	27.00	22.00	0.81
Korea (1984, 1992)	24.00	10.10	0.42
Thailand (1986, 1990)	13.00	11.40	0.88
Kenya (1987/88, 1991/92)	40.00	34.00	0.85
Nigeria (1984, 1990)	35.00	32.70	0.93
Tanzania (1986, 1992)	30.00	33.00	1.10
Colombia (1984, 1992)	61.00	12.00	0.26
Peru (1988, 1992)	57.00	17.00	0.30
Costa Rica (1985, 1992)	53.00	15.00	0.28
Brazil (1987, 1992)	51.00	21.00	0.41
Venezuela (1989, 1991)	37.00	19.00	0.51
Chile (1984, 1991)	35.00	11.00	0.31
Argentina (1988, 1992)	29.40	12.20	0.41
Mexico (1985, 1987)	29.00	10.00	0.34

Source: "Trade Policy Reform in Developing Countries since 1985: A Review of the Evidence", World Bank Discussion Papers, No.267 (1994).

It needs to be added here that the liberalisation of imports does not mean that there is an indiscriminate removal of import restrictions. Imports, on the whole, are still highly restricted. A salient feature of the liberalisation is the elimination of unnecessary procedural hurdles and simplification of procedures. Even though import duty on a number of items has been significantly reduced, the duty rates are still very high in comparison to many other countries (See Table 3.13).

CHAPTER IV

INDIAN ENGINEERING INDUSTRY

The previous chapter analysed the changing scenario of world and Indian Exports. The purpose of this chapter is to examine the importance of Engineering Industry in India.

The chapter has been divided into two sections. The first section deals with the history of Indian engineering industry and the second section describes the engineering industry in relation to economic growth.

History of Indian Engineering Industry

In India, the engineering industry has witnessed tremendous technological progress in the last decade and consequently expertise has been gained in several areas. Technology, whether imported or indigenously developed has put India on the industrial map of the world. Today, she ranks as one of the top ten industrial nations of the world with the largest pool of technical personnel and scientists in the world. She has not only been able to cater to the growing domestic demand but has also achieved commendable success in meeting orders from the quality conscious and sophisticated overseas markets.

The tempo of industrial activity and the span of commercial organisation are not only confined to the present decade but were equally extensive throughout the course of ancient period. Archaeological findings at Mohanjodaro, Harappa and other places in Indus Valley prove beyond any doubt the fact that Indian civilization was thriving as far back as 3000 B.C.[1] We can easily make an estimate of their economic life and the span of their commercial activities from the ruins of the two historic cities of undivided Punjab which now form part of West Pakistan. The industrial and commercial centres in Mohanjodaro and the granary in Harappa convey that, during that period an impressive and extensive commercial and industrial activity had been practised. Because of trade superiority, the country had always enjoyed trade surplus with the whole world including Europe till 1845 A.D. which very few countries of the world could claim (Srivastava, Mudgal and Nigam, 1959).

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1. Engineering Export Promotion Council, National Strategy for Engineering Exports (1979), July, Calcutta.

This may be verified from the description of the Indian industrial economy with particular reference to the engineering industry. A brief history and description about the various industries which mainly comprise Indian engineering industry has been discussed in the following paragraph.

Iron and Steel Industry

This was one of the most important industries of the ancient times which received special attention. Indian steel is mentioned as the best of its kind for weapons by the ancient Greek historian Herodotus while speaking of weapons of the Indian Contingent in Darious Army. The acquaintance of Indians with the use and making of iron is said to date back to 3000 B.C. The iron pillars of Delhi and Dhar are the classic examples of the Indian know-how of the art of smelting iron. During the Medieval period the account of the 12 Subas given by Abdul Fazl in Ain-i-Akbari, the accounts of foreign travellers like Tavernier and Terry testify to the manufacture of pig iron and steel in India. According to the authority of Abul Fazl the Subas of Bengal, Allahabad, Agra, Berar, Gujarat, Delhi and Kashmir were centres of iron production.[2]

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2. Abul Fazal, "Ain-i-Akbari" (Trans.), Vol.11, pp.192-200.

The articles made out of iron and steel were many and varied. Important among them were tools and implements for agricultural and other purposes, weapons of war like swords, arrows, axes, knives and the articles of utility such as needles, utensils, iron rods for roasting meat, razors, fine needles with case-key etc. The Subas of Gujarat, Lahore and Berar at Indus and Nirmal were famous for steel manufacturers.

The products of this industry were exported to foreign countries also. It is stated in a reference that Ormus ships bought to Bathecal horses and pearls and loaded on return voyage, besides other things, cargoes of iron. This is further authenticated by the fact that by about 1640, the Duch were active in developing the iron industry in the Godavari delta and were exporting iron and steel in sufficiently large quantities from Masulipatnam. This act of the foreign merchants also helped the development of the iron and steel industry and improvement in their technique of production.

India's drive for industrialisation began in real earnest only during the Second and Third Five Year Plan periods and attained a rapid growth. This was achieved by setting up three public sector steel plants with the aid of West Germany, Russia and the United Kingdom and through the doubling of production capacity in the private sector. With the rapid changes in technologies, production processes and needs, the Indian Iron and Steel Industry has also diversified its activities.

Steel Forging Industry

In order to compete in the indigeneous and export market, Indian forging manufacturers have started modernisation and technological upgradation measures to bring about energy and material conservation.

Modern forging press lines, using billet sheers band saws, reducer rolls, induction heaters, cross forging machines, have been installed recently resulting in higher productivity. Recent developments in this field have been the use of ceramic fibre linings, high pressure burners and automation of heat treatment furnaces by a few forging units. Reduced draft angler, closer loterances and multi-impression dies are the basic features of modern die technology for the production of near net shape precision forgings. Foreign collaboration with a well known German firm has been approved recently to bridge the technological gap in this field.[3]

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3. DGTD Report, 1984-85, New Delhi, p.17.

Steel Structural Industries

The steel structural industry has been set up over a period of last 55 years and has developed a capability to handle most of the requirements of the country. This industry covers a wide range of structures used for buildings, factories, power houses, bridges, hydraulic gates for dams, penstock and many others. There were 143 units engaged in production of steel structural fabrication with a total approved capacity of 5,30,000 tonnes. The main raw materials are channels, beams, angles and other structural sections which are available indigenously.

Transmission Line Towers

With the increasing industrialisation and alround growth, there is an increasing shift in India to have larger power houses, particularly super thermal stations. Consequently, while there would be fewer but larger power generating stations, the demand for transmission line towers for transmission of energy would grow substantially. The main raw materials for this industry are born mild and high tensile steel particularly in the form of angles and plates. Zinc is the most important non-ferrous metal that is required for galvanising the towers to protect them from weather changes. The industry has achieved an appreciable export performance during the last decade.

Ship Building

Trade, right from the very early times, was conducted both by land and water. A ship is said to have been built by Manu, according to the direction of a fish at the time of the Universal Flood even as far back as 3966 B.C. The Samudra-Vajit Jataka mentions a ship which accommodated 1000 families of wood wrights who emigrated to an island over seas. The Valahasva-Jataka and Suparaga Jataka mention sea voyages undertaken by 500 and 700 merchants respectively. Ship building in medieval times was quite an important industry. The Arab travellers of the ninth and tenth centuries, Chanju-kua in the twelfth, Montecorvino and Marcopolo in the thirteenth, Odori and Ibn Batuta in the fourteenth, Vasco da Gama and Stafuo in the fifteenth and Varthema and Bardosa in the beginning of the sixteenth century had all described the existence of ship building industry in this country. The important centres of ship building on the Malabar Coast were Calicut and Cochin. Gujarat was another centre which was famous for its maritime activity. India was not only self sufficient in its requirement of ships but was also supplying them to the English and Dutch merchants.

Crane Industry

Cranes are one of the most important and critical items of material handling equipment required by various industrial sectors, viz., steel plants, metallurgical industries, fertiliser plants, petrochemical complexes, mining sector, port trusts, power plants and construction industry. The requirement of cranes by these sectors is spread over a wide spectrum ranging from electro-hydraulic deck cranes, EOT cranes, mobile cranes, grab cranes, floating cranes, ladle cranes, tower cranes, metallurgical cranes, container cranes etc. The requirements of cranes are directly related to industrial development programme of the industry.

Fork Lift Truck Industry

Material handling equipment form a vital link in various important industries. The industrial and hand-operated fork lift trucks are used for handling containers and cargoes in harbours and airports, steel sections in the steel plants and stockyards, raw material, heavy equipments and packages in engineering shops of large industrial complexes.

Mechanical Engineering Industry

i) Welded steel pipes and tubes: There are at present 77 units for the manufacture of black and galvanised steel pipes and tubes with an installed capacity of 22 lakh tonnes per annum. One of the units has taken up the production of coated tubes to housing scaffolding T.V. Antenna, mask, furniture etc. One unit is engaged in commercial production of low cost light weight galvanised steel pipes required for sprinkler irrigation system. The demand assessed by the working group for B and G steel pipes and tubes is 16 lakh tonnes and for precision tubes 1.78 lakh tonnes by 1989-90. Against this the capacity installed is about 22 lakh tonnes and 2 lakh tonnes respectively.

ii) Seamless steel pipes and tubes: Applications of seamless steel pipes and tubes can be broadly classified as for oil sector and non-oil sector. In oil sector seamless steel pipes and tubes are required for line pipes, casing pipes, production tubings, drill pipes etc. In non-oil sector seamless steel pipes and tubes are required by a number of priority industries like boilers, fertilizers, petro-chemicals, chemicals, industrial machinery, bearing industry, general engineering automobiles etc.

iii) Stainless steel seamless pipes and tubes: As regards seamless stainless steel pipes and tubes, there is only one unit in public sector, M/s.Nuclear Fuel Complex, Hyderabad. There are 4 units in private sector, engaged in the manufacture of S.S welded and seamless pipes and tubes for an annual capacity of 5,500 tonnes.

iv) Wire rope industry: There are at present 13 units manufacturing steel wire ropes with a total licensed installed capacity of 46,200 tonnes per annum. Wire ropes of various categories covering wide range of requirements are being manufactured in the country including locked coil wire ropes, large diameter heavy weight steel wire ropes and stands for special applications. Indigenous wire ropes have got good export market and as such Indian manufacturers are exporting their products. Further they are capable of offering joint ventures in developing countries.

v) Marine freight containers: In India containarisation is making slow progress. Marine freight containers, however, are exported as required by various foreign leasing companies. The present manufacturers are also exporting their products to Russia and other countries. The bilateral trade agreement between erstwhile USSR and India specifically provide for these containers. The market is further expected to be expanded by the inclusion of this item in various trade agreements with other countries.

vi) Machine tools: The industry is now playing an important role in providing infrastructural support for continuing industrial expansion in India.

In the economic planning of the country since independence, the machine tool industry has enjoyed high priority, particularly in the Second and Third Plan periods. Machine tool industry is the main plank on which the modern industrialisation is based. In the ultimate analysis the capital equipment required for large-scale industrialisation is dependent to a great extent on the products of this industry.

vii) Electronics industry: The Electronics Industry is engaging attention of the Government these days on account of the great potential it has for the development of national economy, having a direct bearing on the improvement in productivity, efficiency, quality etc. In times to come it is likely to improve the quality of the life of the people at large. Principal items produced by the industry are: consumer electronics, control instruments and industrial electronics, computers, communication and broadcasting equipment, aero-space and defence equipments and electronic components.

The small scale sector plays a significant role in the development and growth of the electronics industry. It contributes nearly 45 per cent of consumer electronics, electronic instrumentation, computer and allied items and electronic components manufactured in the country.

Non-Ferrous Metal Industry

Among metals, aluminium occupies a very important place in the Indian economy next to steel. Besides being non-corrosive and non-toxic, it is an excellent conductor of electricity, strong and yet light in weight. Aluminium has gained its significant position not only due to the scarcity of other non-ferrous metals like copper, zinc, lead and tin, but also because of its own intrinsic versatile properties. Hindustan Aluminium Corporation, Madras Aluminium Company and Bharat Aluminium Company are the major units together contributing to the capacity of 4,50,000 tonnes per annum.

Copper, zinc and lead are other imprtant non-ferrous metals used widely in India.

Engineering Industry in Economic Growth

Industrialisation is sine-quo-non of economic development. It is an important means for modernisation. It changes the environment, the quality and pattern of life and is essential for every one.

In India, industrialisation is an integral part of the process of development. The development of Indian economy and industry over the last 45 years of the planned era, though arduous has been a rewarding task. There has been a vast expansion and diversification of industrial structure. Apart from a qualitative increase in output, industrial structure has been widely diversified covering particularly the entire range of consumer, intermediate and capital goods.

Within the industrial sector, the Engineering Industry plays a crucial role in the economic development of the country. It is the key to economic development with its close linkage to every single sector of the economy. It meets the increased needs of the agricultural, capital goods, construction, infrastructure, transport, power and mining sectors and consumer goods sector of the economy besides catering to the defence and nuclear requirements. We begin with an examination of the place of the engineering industry in the total manufacturing sector of the economy as also certain structural characteristics and technical coefficients indicating its performance. In the organised sector the engineering sector accounts for 27 per cent of factories (in 1988-89), 29.7 per cent of employment (in 1991-92), 27 per cent of fixed capital, 31 per cent of total output and 33 per cent of value added of all manufacturing industries in 1991-92 (See Tables 4.1, 4.2 and 4.3).

The ratios provided in Table 4.4 help to trace the direction in which the engineering sector is moving in relation to the manufacturing sector as a whole. The value of fixed capital per employee and per factory has increased during the period 1979-80 to 1988-89 at an annual average rate of 22 per cent and 20 per cent respectively for the engineering sector as against 25 per cent and 22 per cent for the manufacturing sector as a whole. Hence while

Table 4.1: Share of Engineering Goods in the Registered Factory Sector

	ENGINEERING							
Year	No. of factories	Fixed capital	No. of employees	Total emoluments	Value of output	Net value added	Working capital	Pc=Fc+Wc
1979-80	24738	666427	1975062	189678	1597116	352997	413480	1079907
1980-81	25468	744107	1972366	213088	1914942	414349	499714	1243821
1981-82	28020	872397	2004342	242955	2332223	517347	567838	1440235
1982-83	25057	1021058	2074628	284301	2674269	588210	646172	1667230
1983-84	25556	1190087	2087034	328728	2769025	658129	671129	1861216
1984-85	26019	1264198	2170072	393435	3236077	720791	679507	2042705
1985-86	27365	1474684	2044631	394156	3625491	775327	726382	2201066
1986-87	26431	1545673	2008243	427854	3991367	801685	783834	2329507
1987-88	27717	1827407	2110462	492359	4700430	928354	923915	2751322
1988-89	28090	2144747	2152841	556801	6006551	1220303	1062031	3206778
Average Growth Rate	1.51	24.65	1.00	21.51	30.68	27.30	17.43	21.88

Source: 1. Annual Survey of Industries, Summary Results for Factory Sector, CSO, various issues, New Delhi.
2. India: Economic Information Year Book (1992-93).

Table 4.2: Share of Engineering Goods in the Registered Factory Sector

Total - All India								
Year	No. of factories	Fixed capital	No. of employees	Total emoluments	Value of output	Net value added	Working capital	Pc=Fc+Wc
1979-80	95126	2632953	7678271	537190	5225785	1036450	1105996	3789859
1980-81	96503	2990039	7714679	609651	6108403	1192877	1320840	4310978
1981-82	105037	3470259	7777868	677753	7367247	1455457	1505488	4975747
1982-83	93166	4100600	3009792	804609	8623768	1667368	1631988	5732588
1983-84	96705	4860554	7824121	921825	9353741	2013718	1850402	6710956
1984-85	96947	5481211	7871712	1066021	10556600	2088716	2232323	7716534
1985-86	101016	6008524	7471515	1108113	12015540	2326647	2379864	8388388
1986-87	97957	6723094	7441879	1229918	13304352	2555224	2180329	8903423
1987-88	102596	7847463	7785580	1408105	15397307	2833060	2755102	10602565
1988-89	104077	8909875	7743344	1572838	18434878	3463480	2724616	11634491
Average Growth rate	1.05	25.79	0.09	21.42	28.09	24.31	Nil	23.01

Source: 1. Annual Survey of Industries, Summary Results for Factory Sector, CSO, various issues, New Delhi.
2. India: Economic Information Year Book (1992-93).

Table 4.3: Share of Engineering Goods in the Registered Factory Setor

(In per cent)

Year	No. of factories	Fixed capital	No. of employees	Total emoluments	Value of output	Net value added	Working capital	Pc=Fc+Wc
1979-80	26.01	24.84	25.72	35.31	30.56	32.49	37.39	28.50
1980-81	26.39	24.89	25.57	34.95	31.35	34.74	37.83	28.85
1981-82	26.68	25.14	25.77	35.85	31.66	35.55	37.72	28.95
1982-83	26.90	24.90	25.90	35.33	31.01	35.28	39.59	29.08
1983-84	26.43	24.48	26.67	35.66	29.60	32.68	36.27	27.73
1984-85	26.84	24.88	27.57	36.91	30.65	34.51	30.52	26.47
1985-86	27.09	24.54	27.39	35.57	30.17	33.32	30.52	26.16
1986-87	26.98	22.99	26.99	34.79	30.00	31.37	35.95	26.16
1987-88	27.02	23.29	27.11	34.97	30.53	32.77	33.53	25.95
1988-89	26.99	24.07	27.80	35.40	32.58	35.23	39.98	27.56

Source: 1. Annual Survey of Industries, Summary Results for Factory Sector, CSO, various issues, New Delhi.
2. India: Economic Information Year Book (1992-93).

Table 4.4: Foreign Collaboration Agreements (Engineering Sector)

(Rs. in crore)

Product Group	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total 1983 to Feb.1992
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Boilers and steam generating plants	2	3	13	5	1	2	11	7	7	51
2. Prime movers (other than electrical generators)	2	6	15	--	--	6	2	2	1	34
3. Electrical equipment	129	157	205	175	183	183	99	83	184	1403
4. Transportation	39	63	101	53	39	38	30	22	73	458
5. Industrial machinery	115	138	152	108	132	141	59	75	190	1110
6. Machine tools	44	34	32	13	10	21	9	24	23	210
7. Agricultural machinery	2	2	3	3	--	3	3	--	5	21
8. Earth moving machinery	8	4	11	--	--	4	--	--	7	34
9. Misc. Mechanical engineering	35	44	45	47	50	68	26	88	34	437
10. Industrial instruments	37	56	52	20	47	43	35	38	45	373
11. Metallurgical industries	20	26	53	45	29	27	30	26	40	296
12. Consultancy	13	14	23	5	47	39	20	10	35	206

(Contd.)

Table 4.4 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
13. Telecommunication	7	3	36	37	16	23	37	69	19	247
14. Com. Office & house-hold equipments	9	3	20	10	7	10	18	7	9	93
15. Medical & surgical appliances	2	1	5	12	10	18	6	5	8	67
16. Scientific instruments	--	--	2	13	4	3	5	--	4	31
17. Saths & Surveying instruments	--	--	1	1	--	2	2	--	--	6
A) Sub Total	464	554	769	547	575	631	392	461	684	5077
B) All industries	675	752	1024	954	856	923	605	666	1053	7508
A as per cent of B	68.74	73.67	75.10	57.34	67.17	68.36	64.79	69.22	64.96	57.62

Note: Products Groups making up the Engineering Sector follow the categorization given by the CEI, in their Annual Hand Book of Statistics.

Source: Centre for Monitoring Indian Economy, Basic Statistics Relating to the Indian Economy (1992), Vol.1, All India, August, Bombay.

capital intensity has increased in the engineering sector, the intensity of increase is not faster than that for the manufacturing sector as a whole. Further, though there has not been any substantial rise in the capital output ratio for the manufacturing sector as a whole, in the engineering sector on the contrary, the ratio of fixed capital to value added has declined.

Foreign collaboration agreements in the engineering sector accounts for around 65 per cent of total agreements approved in the country (See Table 4.5).

The export performance of the engineering sector as a percentage of total exports for the period 1979-80 to 1988-89 is given in Tables 4.6 and 4.7.

The data provided by the RBI, regarding expenditure on R & D for the engineering sector, presents a dismal picture as far as the corporate sector is concerned (Table 4.8). Engineering R & D as a percentage of total R & D expenditure for the industrial sector shows a declining trend between 1985-86 and 1989-90; this is at a time when foreign collaboration agreements, particularly in the engineering sector, have been showing an increasing trend.

Table 4.5: Exports to Value of Production - Select Industries

(Per cent)

Product Group	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
1. Tea plantations	15	12	12	13	11	11	11	12
2. Sugar	1	1	3	1	0	1	1	1
3. Tobacco	13	29	30	25	21	19	14	17
4. Cotton textiles	3	2	3	3	3	7	6	9
5. Jute textiles	-		-	-	14	12	9	7
6. Silk and rayon textiles	0	1	1	1	1	1	3	2
7. Aluminium	3	4	3	2	3	3	5	8
8. Engineering	4	4	4	3	3	3	4	5
(i) Motor vehicles	5	4	4	3	3	3	3	4
(ii) Electrical machinery apparatus, appliances etc.	7	6	5	4	4	4	5	5
(iii) Machinery other than transport and electrical	4	5	5	5	5	5	6	8
(iv) Foundries and engineering workshops	1	2	2	1	1	1	2	4
(v) Ferrous/nonferrous metal products	3	2	2	2	1	2	2	3

(Contd.)

Table 4.5 contd.

Product Group	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
9. Chemicals	4	4	4	4	4	4	4	6
(i) Medicines and pharmaceutical preparations	5	4	5	5	5	4	6	8
(ii) Paints and varnishes	0	0	0	0	4	4	4	3
(iii) Basic industrial chemicals of which chemical fertilizers	2	2	2	2	2	2	3	3
10. Cement	2	1	2	1	1	1	1	1
11. Rubber and rubber products	2	2	3	3	5	5	5	7
12. Paper and paper products	1	0	0	0	0	0	1	1
Total (including others)	5	4	4	4	4	4	5	6

Source: Calculated from "Finances of Public Limited Companies", RBI Bulletin, various issues, Bombay.

Table 4.6: Exports to Imports Ratios - Select Industries

(Per cent)

Industry/Industry Group	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
1. Tea plantations	2222	3515	2375	1407	1346	1476	1158	1063
2. Sugar	354	94	221	204	15	129	128	85
3. Tobacco	2379	1808	2820	2560	1585	1222	1310	1442
4. Cotton textiles	67	61	77	46	49	145	93	161
5. Jute textiles	0	0	0	0	822	594	331	946
6. Silk and rayon textiles	1	10	17	7	11	46	55	52
7. Aluminium	129	158	126	56	71	18	110	181
8. Engineering	53	50	56	41	34	38	42	48
(i) Motor vehicles	64	59	68	43	38	39	39	47
(ii) Electrical machinery apparatus, appliances etc.	87	80	62	44	41	42	50	44
(iii) Machinery other than transport and electrical	46	48	63	61	45	53	66	86
(iv) Foundries and engineering workshops	13	16	25	9	9	10	18	23
(v) Ferrous/nonferrous metal products	26	21	25	21	21	24	12	26

(Contd.)

Table 4.6 contd.

Industry/Industry Group	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
9. Chemicals	57	54	49	42	41	45	37	49
(i) Medicines and pharmaceutical preparations	83	73	80	79	68	67	73	84
(ii) Paints and varnishes	0	0	0	0	53	59	41	31
(iii) Basic industrial chemicals of which chemical fertilizers	1	1	0	2	1	1	1	1
10. Cement	114	49	96	79	106	103	67	71
11. Rubber and rubber products	25	36	54	56	46	76	60	88
12. Paper and paper products	34	6	1	2	1	2	6	10
Total (including others)	81	76	88	68	55	66	62	75

Source: Calculated from "Finances of Public Limited Companies", RBI Bulletin, various issues, Bombay.

Table 4.7: Expenditure in Technology Imports per Firm

(Per cent)

Industry/Industry Group	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
1. Tea plantations	8	10	11	14	20	22	28	52
2. Sugar	0	1	2	14	1	1	6	8
3. Tobacco	85	35	61	54	53	79	106	120
4. Cotton textiles	20	9	15	27	41	43	55	37
5. Jute textiles	0	0	0	0	1	3	2	1
6. Silk and rayon textiles	0	7	15	19	15	19	17	13
7. Aluminium	59	64	49	71	57	58	70	103
8. Engineering	26	23	26	31	29	30	37	48
(i) Motor vehicles	50	39	57	58	52	54	72	100
(ii) Electrical machinery apparatus, appliances etc.	29	24	27	21	27	23	28	32
(iii) Machinery other than transport and electrical	38	36	38	61	50	53	64	88
(iv) Foundries and engineering workshops	5	7	6	6	7	8	9	14
(v) Ferrous/nonferrous metal products	7	4	5	4	9	3	11	14

(Contd.)

Table 4.7 contd.

Industry/Industry Group	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
9. Chemicals	23	17	18	26	27	32	52	72
(i) Medicines and pharmaceutical preparations	18	17	20	25	24	18	25	34
(ii) Paints and varnishes	0	0	0	0	13	18	22	22
(iii) Basic industrial chemicals of which chemical fertilizers	28	23	14	31	75	118	233	335
10. Cement	28	30	48	62	62	70	59	81
11. Rubber and rubber products	24	24	29	30	42	61	59	78
12. Paper and paper products	16	21	70	14	17	13	7	10
Total (including others)	22	26	27	29	28	27	38	46

Note: TIE refers total import expenditure made up of royalty, dividend, technical and consultancy fees etc.
Source: Calculated from "Finances of Public Limited Companies", RBI Bulletin, various issues, Bombay.

Table 4.8: Expenditure on Research and Development

(Rs. crores)

Industry/Industry Group	1985-86		1986-87		1987-88		1988-89		1989-90	
	No. Cos.	Exp. on R & D	No. Cos.	Exp. on R & D	No. Cos.	Exp. on R & D	No. Cos.	Exp. on R & D	No. Cos.	Exp. on R & D
1. Engineering	54793	14.67	547	17.29	541	22.02	541	17.06	541	13.83
(a) Motor vehicles	6019	6.76	60	7.50	66	5.39	66	4.76	66	7.26
(b) Electrical machinery apparatus, appliances	12330	2.27	123	3.50	134	5.57	134	3.11	134	3.14
(c) Machinery other than transport and electrical	15825	4.95	158	5.67	135	9.94	135	7.95	135	2.44
(d) Foundries and Engineering works	10710	0.29	107	0.30	105	0.35	105	0.46	105	0.38
(e) Ferrous/non-ferrous metal works	856	0.32	85	0.22	93	0.46	93	0.43	93	0.55
Total for all industry	194289	33.03	1942	51.22	1908	50.10	1908	44.61	1908	55.25
Engg. R & D as %		44.4		33.76		43.95		38.24		25.03
Per Firm R & D		0.03		0.03		0.04		0.03		0.03
Per Firm R & D Total		0.02		0.03		0.03		0.02		0.03

Source: Reserve Bank of India (1992-93), Bombay.

Engineering industry is the base for growth and development. Its impact can be gauged from the following data (Bhasin, 1991).

Weight of Engineering in the index of industrial production (percentage)	32.2
Engineering industry as a percentage of value added by all industry	33.2
Engineering industry as a percentage of employment in all industry	29.7
Engineering industry as a percentage of value of output of all industry	31.0
Engineering industry as a percentage of investment in all industry	28.4
Research and development expenditure in engineering industry as a percentage of total expenditure in all industry	65.9
Foreign collaboration in engineering industry as percentage of total foreign collaborations	62.0

It is no wonder that the engineering industry has been titled as the "Engine of Growth". The tremendous impact and influence it has on industrialisation and consequently on the economy can be clearly seen from the economic scenario the world over. It has catapulated many nations like Japan, Germany, USA etc. into the frontline industrial nations within a very short period.

During the 45 years of independence, India has achieved commendable progress. Despite the doubling of population, self sufficiency in foodgrains and most of agricultural raw materials have been achieved. The country has developed a strong and diversified technological and industrial base. In most of the manufactured goods, the country has achieved self sufficiency. As far as infrastructural facilities are concerned, the country has developed a good system of roadways, ports, telecommunication, power, air services etc. The Indian railway system is the third largest in the world. It has also the third largest reservoir of technical and scientific manpower, after the USA and the erstwhile USSR. Some of the manufacturing plants set up in India are among the largest in the world e.g.,power equipment and machine tools plant. The engineering industry has contributed in a large measure to the growth in all these sectors.

The links between agriculture and industry are quite strong. A large part of industrial output is demanded by agricultural sector e.g., tractors, harvest threshers, diesel engines, pumps, excavators and agricultural machinery. The demand is not only for consumer goods but also for manufactured inputs and implements. The engineering industry contributes more by way of the latter than former. The year 1982-83 - the poor year for engineering industry also saw a decline in agricultural output by as much as 4 per cent, as severe drought depressed kharif production in that year. This correlation is not coincidental. It has happened in the past between 1962-63 and again between 1978-79 - when poor agricultural performances corresponded to deceleration (though never decline) in engineering industry.

The forward and backward linkages provided by the engineering industry has contributed to the setting up of ancillary and auxiliary industries. Most of these industries were set up in the small scale sector. Thus, the engineering industry, in an indirect way contributed to the growth in the number of small scale industries in the country.

As far as infrastructure is concerned the engineering industry created the demand push for these facilities. As these industries were set up in different parts of the country, the communication system had to be improved. The engineering industry also manufactured railway wagons, heavy commercial vehicles, ships and the like which were essential for the improvement of infrastructural facilities.

Metals and machines provide not only the foundation of modern industrial civilization, they are also the pillars on which the present day industrial edifice is built up. In any massive programme of industrialisation the role of machinery is obvious. Through the machine building industry the strong foundation of industrialisation of the country is laid.

Prima facie there appears to be a close linkage between the over all growth in industrial output and that of the engineering industry in India (See Table 4.9).

The engineering industry has maintained a high level of growth during the successive Five Year Plans.

Table 4.9: Growth Rates of Engineering Industry Production vis-a-vis All Industry Production Rate

(Percentage)

Plan period	All Industry Production	Engineering Production
2nd Plan	6.6	8.7
3rd Plan	9.0	21.8
4th Plan	3.7	5.8
5th Plan	6.2	6.7
6th Plan	6.3	5.2
7th Plan	8.4	11.7

Source: Indian Institute of Public Opinion, Monthly Commentary (1991), Sept., New Delhi, p.III.

Excepting the first half of the 'eighties', its growth rate has been higher than the all-industry rate (See Table 4.10).

The slackening of the engineering industry during the 'seventies' is attributed to sluggishness in the overall economic activity of the country and its greater involvement in the Gulf region, mainly due to large export opportunities emanating from the hike in oil prices. A spurt in the growth rate was, however, noticed in the second half of the eighties, the growth rate during the Seventh Plan period going up to 11.2 per cent, exceeding thus not only the All Industry Rate (8.4 per cent) but also the plan target fixed for the engineering sector (10.5 per cent). Sectoral growth of the Indian engineering industry during the Seventh Plan is indicated in Table 4.11.

Fluctuations in the annual growth rates of different product-groups within the engineering sector notwithstanding, the average yearly growth rate during 1985-89 was the highest in the case of electrical machinery, apparatus and appliances (24.5 per cent) followed by basic metals and alloy products (7.8 per cent), transport equipment and parts (6.9 per cent), metal

Table 4.10: Growth Rates of Engineering Industry vis-a-vis All Industry Rate

(Percentage)

Period	All Industry rate	Engineering goods rate
1950-51 to 1960-61	7.1	14.9
1960-61 to 1970-71	6.3	7.9
1970-71 to 1980-81	4.2	4.6
1980-81 to 1985-86	6.2	6.0
1985-86 to 1988-89	8.4	11.2

Source: Confederation of Engineering Industry, New Delhi, 1991.

Table 4.11: Sectoral Growth of Engineering Industry (Base 1980-81 = 100)

(Growth rate per cent)

	1985-86 over 1984-85	1986-87 over 1985-86	1987-88 over 1986-87	1988-89 over 1987-88	1985-89 (average)
Basic metals and alloy products	9.0	8.4	6.9	6.9	7.8
Metal products and parts, excepting machinery and transport equipment	9.2	8.5	4.2	3.0	6.2
Machinery, machine tools and parts, excepting electrical machinery	2.0	8.9	1.8	15.2	6.1
Electrical machinery, apparatus and appliances	34.8	27.0	31.6	4.6	24.5
Transport equipment and parts	3.2	6.7	4.8	13.1	6.9

Source: Government of India, Ministry of Finance, Economy Survey, 1989-90.

products and parts excepting machinery and transport equipment (6.2 per cent) and machinery, machine tools and parts, excepting electrical machinery (6.1 per cent).

Engineering industry in India, as elsewhere, is a vast field of industrial activity. Its products are many and also varied. Their continued growth and development have been a source of strength to the Indian economy. Considerable saving of foreign exchange were effected by import substitution in automobile, industrial machinery and heavy electricals. Infact the impact of import substitution on the development processof economy is not as pronounced in other sectors of the economy as it is in the engineering sector.

Foreign investment and technical know-how has acted as catalyst in the development of Indian engineering industry. It is true that foreign collaboration still continues to take place, but only in those specific areas where indigenous technology has not yet developed. In fact the very idea of foreign collaboration has undergone a genetic change with the idea of 'producing together to have optimum utilisation of both the involved countries'. The foreign collaboration in the engineering industry constitute 62 per cent (1991) of the total foreign collaborations in the country.

Concentration of Units

Although engineering units are scattered all over the country, they are mainly located in Maharashtra (Bombay and Pune); West Bengal (Calcutta, Durgapur and Jamshedpur); Gujarat (Ahmedabad and Baroda); Tamil Nadu (Madras and Coimbatore); Andhra Pradesh (Hyderabad and Vijayawada); Uttar Pradesh (Kanpur, Aligarh and Agra); Punjab (Ludhiana, Jalandhar and Amritsar); Karnataka (Bangalore and Mysore) and Haryana (Faridabad, Sonepet and Ambala).

CHAPTER V

GROWTH AND TRENDS IN INDIA'S ENGINEERING EXPORTS

The process of industrialisation has brought remarkable changes in the economic structure of the country. India attained self-sufficiency in production of several important items of machinery after launching the planned industrial development programme. Simultaneously a nationwide campaign termed as, "import substitution" was launched in the country. As a result of these continuous efforts, commendable achievements were made in the production as well as in the export front in industrial and engineering goods. The production patterns in different industrial fields were thoroughly diversified and the industrial programmes have entered a completely new phase. Goods which were on our import list for ages, have now become important export items as lucrative foreign exchange earners. For a better understanding of the importance of exporting engineering goods, the national policy and the global economic environment should be analysed. In this chapter an attempt is made to show how and during what stages the export of engineering goods showed a positive progress and what type of policy should be adopted in future to boost the exports.

Pre-eminent Position

By virtue of its pre-eminent position and higher levels of growth in the industrial sector, engineering industry has been able to throw up surpluses enough for an impressive export performance. This is evident from the fact that foreign exchange earnings from engineering goods, valued at Rs.5.16 crore in 1956-57, spurted to Rs.6,780 crore in 1992-93. India's exports of engineering goods vis-a-vis total exports from the country are given in Table 5.1.

A significant feature of India's engineering exports is that with the exception of a meagre decline of Rs.2 lakh in 1958-59 (over the previous years), they always scaled new heights until 1982-83, when the figure touched a level of Rs.1,160 crore. In fact, the engineering export growth during the sixties and seventies was the highest. Exports dipped to Rs.1,000 crore later in 1983-84 but again picked up, increasing to Rs.1,150 crore in 1984-85. The export stagnation was but an off-shoot of the industrial recession in the developed countries and near completion of construction activity in the Middle East.

The position was, however, retrieved in 1987-88, when foreign exchange earnings of engineering exports

Table 5.1: Percentage Share of Engineering Exports* to Total Exports

(Rs. in crore)

Year	Total Exports	Engineering Exports	Percentage share of Eng. Exports to Total Exports
(1)	(2)	(3)	(3)
1956-57	605.00	5.16	0.85
1957-58	561.00	5.97	1,06
1958-59	581.00	5.95	1.02
1959-60	640.00	7.71	1.20
1960-61	642.00	10.31	1.61
1961-62	660.00	12.01	1.82
1962-63	685.00	14.56	2.13
1963-64	793.00	20.82	2.63
1964-65	816.00	25.98	3.18
1965-66	510.00	29.41	5.77
1966-67	1157.00	30.70	2.65
1967-68	1199.00	41.05	3.42
1968-69	1358.00	84.41	6.22
1969-70	1413.00	105.63	7.48
1970-71	1535.00	115.76	7.54
1971-72	1608.00	125.27	7.79
1972-73	1971.00	141.78	7.19
1973-74	2523.00	193.47	7.67
1974-75	3329.00	349.11	10.49
1975-76	4036.00	408.22	10.11
1976-77	5142.00	551.68	10.73
1977-78	5408.00	623.96	11.54

Table 5.1 contd.

(1)	(2)	(3)	(4)
1978-79	5726.00	716.93	12.52
1979-80	6418.00	736.68	11.48
1980-81	6711.00	874.17	13.03
1981-82	7806.00	1046.98	13.41
1982-83	8803.00	1011.30	11.49
1983-84	9771.00	1000.00	10.23
1984-85	11744.00	1155.00	9.83
1985-86	10895.00	1095.00	10.05
1986-87	12452.00	1203.73	9.67
1987-88	15674.00	1355.00	8.64
1988-89	20232.00	1589.00	7.85
1989-90	27658.00	2350.00	8.50
1990-91	32553.00	3500.00	10.75
1991-92	44828.00	5025.00	11.21
1992-93	53688.00	6780.00	12.63

* As per the classification followed by the Confederation of Engineering Industry and the Engineering Export Promotion Council, this sector excludes the electronic and computer software.

Source Compiled from

1. Engineering Export Promotion Council, Data Sheet, various issues, Calcutta.
2. Reserve Bank of India Bulletin, various issues, Bombay.

surged to Rs.1,355 crore as against Rs.1,155 crore in 1986-87. Thereafter, the export situation has improved consistently and touched a figure of Rs.6,780 crore (Rs.8,153.16 crore including electronics and software) in 1992-93. Among the non-traditional items, which constitute nearly 50 per cent of the all India total, engineering exports stands at the very top.

Higher Growth Rate

Barring a little deceleration in the eighties, the average annual growth rate of engineering exports has been substantially higher than the all India rate during the previous three decades, as shown in Table 5.2.

Based on the data of Tables 5.3, 5.4, 5.5, 5.6 and 5.7 a semi-log model with time, as the explanatory variable is fitted to find out the exponential growth rate of engineering exports, GNP, NNP, GDP and India's total export.

$$\ln y = A + Bt + e$$

t = time

A and B are the parameters, and

e = random error.

The estimated value is given in Table 5.2.

Table 5.2 shows the exponential growth rates of India's engineering exports vis-a-vis the country's overall exports, GNP, NNP and GDP for the period 1956-57 to 1992-93. The exponential growth rates of engineering exports rose consistently along with India's overall exports, GNP and NNP during 1956-57 to 1975-76. The rapid growth of India's exports and engineering exports during the seventies is generally explained with reference to (Reddy and Hemalatha, 1994) - (a) the emergence of new manufactures particularly engineering goods through the utilisation of capacities created in the wake of the import substituting industrialisation policy pursued since the Second Five Year Plan, (b) the vigorous export promotion policy pursued by the government and the consequent improved incentives and (c) the domestic recession in the Indian economy which compelled the Indian industry to look upon exports as an outlet for some of the capacities created in the course of industrialisation. But during the period 1976-77 to 1985-86, the growth rate in India's overall exports as well as engineering exports declined to 9.67 per cent and 8.05 per cent respectively. During the same period the GNP and NNP increased only marginally. Therefore it is evident that the exponential growth rates of engineering exports which exceeded that of overall

Table 5.2: Exponential Growth Rates of India's Engineering Exports

(Values in percentages)

Period	Engineering exports	All India exports	GNP	NNP	GDP
1956-57 to 1965-66	20.78	1.74	8.33	8.16	---
1966-67 to 1975-76	26.29	13.66	10.38	10.18	---
1976-77 to 1985-86	8.05	9.67	12.71	12.39	---
1986-87 to 1992-93	30.70	24.86	14.77	14.76	14.91
1956-57 to 1992-93	19.43	12.01	11.15	10.94	---
1980-81 to 1992-93	--	--	--	--	13.56

Source: Calculated on the basis of the data of the Directorate General of Commercial Intelligence and Statistics, Calcutta and Engineering Export Promotion Council, Calcutta.

exports during fifties, sixties and the greater part of seventies could not be maintained in the subsequent period largely due to the adverse impact of external factors like discernable softening of commodity prices in world market and slow down of economic expansion in the oil exporting countries and internal factors like the sharp decline in the agricultural production, which resulted in the decline of the volume of domestic resource based manufactures and increase in the domestic demand for industrial goods due to increase in the levels of investment and output in the industrial sector (Deepak Nayyar, 1987). The factors that inhibited India's exports during the same period include the depressed international economic environment and the protectionist measures adopted by industrially developed countries (Trivedi, 1990).

Apart from these factors, a very important disadvantage which has contributed to India's rather dismal performance in the international market for engineering product was that there has been no planning for production exclusively meant for export (Sonal, 1988). The sudden increase of oil prices - 'oil shocks' - as they are called, in the seventies, affected Indian economy badly. In 1980-81, India had to spend a major portion of its export earnings only on the import of petroleum products. This seriously affected the availability of foreign exchange for the growth and modernisation of the engineering industry when it was needed (Balagopal, 1992). The hostile international environment for the developing countries during this period also affected our engineering exports (Reddy and Hemalatha, 1994). However, during 1956-57 to 1992-93, engineering exports increased by a compound rate of 19.43 per cent per annum while overall exports rose by 12.01 per cent and NNP increased by 10.94 per cent only.

The lower growth rate of engineering exports vis-a-vis all India exports during the eighties stems from their stagnation till 1985-86. With the spurt in engineering exports from 1986-87 onwards, their position improved substantially. Incidently, export of engineering products grew at the rate of 5 per cent in 1986-87 over the negative growth of 5.19 per cent recorded in 1985-86. This growth has continued in later years, recording an increase of 12.57 per cent in 1987-88, 17.27 per cent in 1988-89, 47.89 per cent in 1989-90 and 48.94 per cent in 1990-91. Subsequently, this growth has decelerated but its comparative upsurge has been higher than that of all India (See Tables 5.3 and 5.4).

Table 5.3: Trends in Total Exports

(Rs. in crore)

Year	Exports	Percentage change over previous year
(1)	(2)	(3)
1956-57	605.00	
1957-58	561.00	-7.27
1958-59	581.00	3.57
1959-60	640.00	10.15
1960-61	642.00	0.31
1961-62	660.00	2.80
1962-63	685.00	3.79
1963-64	793.00	15.77
1964-65	816.00	2.90
1965-66	510.00	-37.50
1966-67	1157.00	126.86
1967-68	1199.00	3.63
1968-69	1358.00	13.26
1969-70	1413.00	4.05
1970-71	1535.00	8.63
1971-72	1608.00	4.76
1972-73	1971.00	22.57
1973-74	2523.00	28.01
1974-75	3329.00	31.95
1975-76	4036.00	21.24
1976-77	5142.00	27.40
1977-78	5408.00	5.17

Table 5.3 contd.

(1)	(2)	(3)
1978-79	5726.00	5.88
1979-80	6418.00	12.09
1980-81	6711.00	4.57
1981-82	7806.00	16.32
1982-83	8803.00	12.77
1983-84	9771.00	11.00
1984-85	11744.00	20.19
1985-86	10895.00	-7.23
1986-87	12452.00	14.29
1987-88	15674.00	25.88
1988-89	20232.00	29.08
1989-90	27658.00	36.70
1990-91	32553.00	17.70
1991-92	44828.00	37.71
1992-93	53688.00	19.76

Source: 1. Reserve Bank of India Bulletin, Various issues, Bombay.
2. Govt. of India, Ministry of Finance, Economic Survey, 1993-94, New Delhi.

The high growth of engineering exports after 1991 is due to liberalisation also. Restrictions on manufactured exports were virtually removed (Judith M.Dean, et. al. 1994). Apart from classical arguments for gains from free trade, it is pointed out that trade liberalisation increases the volume of exports in two different ways (Bose, 1993). First, through trade liberalisation, imported inputs going into the production of exports become cheaper which naturally stimulates exports. Secondly and perhaps more importantly, trade liberalisation creates more competition in the domestic market thereby destroying local monopolies. Therefore, a domestic producer enjoying virtual monopoly power in the domestic market, through artificial barriers to international trade, would find selling in domestic market much less attractive after liberalisation. This would induce him to export to the world market (Sugata Marjit and Abhirup Sarkar, 1995).

Engineering Exports in GNP, NNP and GDP

An economy's productive activity can be represented in a number of ways. Basic among them is Gross National Product, Net National Product and Gross Domestic Product. These measures measure, in money terms, gross value of the final product of an economy's productive activity over a specified period, normally a year.

During the years 1956-57 to 1963-64 the share of India's engineering exports in the total GNP and NNP was fluctuating between 0.04 to 0.09 per cent in the case of GNP and 0.05 to 0.11 per cent in the case of NNP. Thereafter, it gradually picked up and came to stay at around 0.33 per cent in the case of GNP and 0.30 per cent in the case of NNP during 1969-70 to 1973-74 (See Tables 5.5, 5.6 and 5.7).

The share of engineering exports in India's total GNP and NNP after mid-seventies until 1981-82 maintained an increasing trend. During this period the percentage share increased from 0.52 per cent in 1974-75 to 0.73 per cent in 1981-82 in the case of GNP and 0.57 per cent in 1974-75 to 0.81 per cent in 1981-82 in the case of NNP. However, the percentage share of engineering exports in the GNP and NNP steeply declined particularly from 1982-83 onwards and stagnated at around 0.46 per cent in the case of GNP and 0.52 per cent in the case of NNP. After that it started rising. In the year 1992-93 the contribution of engineering exports in the GNP and NNP increased to 1.10 per cent and 1.24 per cent respectively. With an

Table 5.4: Trends in Engineering Exports

(Rs. in crore)

Year	Engineering Exports	Percentage change over previous year
(1)	(2)	(3)
1956-57	5.16	
1957-58	5.97	15.70
1958-59	5.95	-0.34
1959-60	7.71	29.58
1960-61	10.31	33.72
1961-62	12.01	16.49
1962-63	14.56	21.23
1963-64	20.82	42.99
1964-65	25.98	24.78
1965-66	29.41	13.20
1966-67	30.70	4.39
1967-68	41.05	33.71
1968-69	84.41	105.63
1969-70	105.63	25.14
1970-71	115.76	9.59
1971-72	125.27	8.22
1972-73	141.78	13.18
1973-74	193.47	36.46
1974-75	349.11	80.45
1975-76	408.22	16.93
1976-77	551.68	35.14
1977-78	623.96	13.10

Table 5.4 contd.

(1)	(2)	(3)
1978-79	716.93	14.90
1979-80	736.68	2.75
1980-81	874.17	18.66
1981-82	1046.98	19.77
1982-83	1011.30	-3.41
1983-84	1000.00	-1.12
1984-85	1155.00	15.50
1985-86	1095.00	-5.19
1986-87	1203.73	9.93
1987-88	1355.00	12.57
1988-89	1589.00	17.27
1989-90	2350.00	47.89
1990-91	3500.00	48.94
1991-92	5025.00	43.57
1992-93	6780.00	34.93

Source: Compiled from the Data Sheets of Engineering Export Promotion Council, Calcutta.

Table 5.5: Percentage Share of Engineering Exports to GNP at Factor Cost

(Rs. in crore)

Year	Engineering Exports	GNP at Current Price	Percentage share of Eng. Exports to GNP at Factor Cost
(1)	(2)	(3)	(4)
1956-57	5.16	11583.00	0.04
1957-58	5.97	11839.00	0.05
1958-59	5.95	13231.00	0.04
1959-60	7.71	13877.00	0.06
1960-61	10.31	15182.00	0.07
1961-62	12.01	15999.00	0.08
1962-63	14.56	17104.00	0.09
1963-64	20.82	19559.00	0.11
1964-65	25.98	22836.00	0.11
1965-66	29.41	23899.00	0.12
1966-67	30.70	27159.00	0.11
1967-68	41.05	31929.00	0.13
1968-69	84.41	33688.00	0.25
1969-70	105.63	37057.00	0.29
1970-71	115.76	39424.00	0.29
1971-72	125.27	41957.00	0.30
1972-73	141.78	46171.00	0.31
1973-74	193.47	56629.00	0.34
1974-75	349.11	66748.00	0.52
1975-76	408.22	70946.00	0.58

Table 5.5 contd.

(1)	(2)	(3)	(4)
1976-77	551.68	76303.00	0.72
1977-78	623.96	87118.00	0.72
1978-79	716.93	93724.00	0.76
1979-80	736.68	102595.00	0.72
1980-81	874.17	122772.00	0.71
1981-82	1046.98	143256.00	0.73
1982-83	1011.30	158761.00	0.64
1983-84	1000.00	185779.00	0.54
1984-85	1155.00	207109.00	0.56
1985-86	1095.00	232370.00	0.47
1986-87	1203.73	258225.00	0.47
1987-88	1355.00	292232.00	0.46
1988-89	1589.00	348207.00	0.46
1989-90	2350.00	402930.00	0.58
1990-91	3500.00	468059.00	0.75
1991-92	5025.00	540143.00	0.93
1992-93	6780.00	616504.00	1.10

Source: Compiled from

1. Engineering Export Promotion Council, Data Sheet, various issues, Calcutta.
2. Reserve Bank of India Bulletin, various issues, Bombay.

Table 5.6: Percentage Share of Engineering Exports to NNP at Factor Cost

(Rs. in crore)

Year	Engineering exports	NNP at current prices	Percentage share of Eng. exports to NNP at Factor Cost
(1)	(2)	(3)	(4)
1956-57	5.16	10972.00	0.05
1957-58	5.97	11177.00	0.05
1958-59	5.95	12459.00	0.05
1959-60	7.71	13035.00	0.06
1960-61	10.31	14242.00	0.07
1961-62	12.01	14946.00	0.08
1962-63	14.56	15947.00	0.09
1963-64	20.82	18258.00	0.11
1964-65	25.98	21373.00	0.12
1965-66	29.41	22247.00	0.13
1966-67	30.70	25215.00	0.12
1967-68	41.05	29745.00	0.14
1968-69	84.41	31311.00	0.27
1969-70	105.63	34421.00	0.31
1970-71	115.76	36503.00	0.32
1971-72	125.27	38717.00	0.32
1972-73	141.78	42510.00	0.33
1973-74	193.47	52362.00	0.37
1974-75	349.11	61290.00	0.57
1975-76	408.22	64623.00	0.63
1976-77	551.68	69523.00	0.79
1977-78	623.96	79749.00	0.78

Table 5.6 contd.

(1)	(2)	(3)	(4)
1978-79	716.93	85298.00	0.84
1979-80	736.68	92324.00	0.80
1980-81	874.17	110685.00	0.79
1981-82	1046.98	128797.00	0.81
1982-83	1011.30	141875.00	0.71
1983-84	1000.00	166550.00	0.60
1984-85	1155.00	185018.00	0.62
1985-86	1095.00	206133.00	0.53
1986-87	1203.73	228402.00	0.53
1987-88	1355.00	258891.00	0.52
1988-89	1589.00	309286.00	0.51
1989-90	2350.00	357931.00	0.66
1990-91	3500.00	416495.00	0.84
1991-92	5025.00	477868.00	1.05
1992-93	6780.00	544935.00	1.24

Source: Compiled from

1. Engineering Export Promotion Council, Data Sheet, various issues, Calcutta.
2. Reserve Bank of India Bulletin, various issues, Bombay.

increasing share in the country's GNP, engineering exports will have a more pervasive and significant effect on the country's economic performance in the years to come than in the past.[1]

Similarly, the contribution of India's engineering exports to the Gross Domestic Product was 0.77 per cent in 1970-71 and 0.66 per cent in 1981-82. After that it declined to 0.40 per cent in 1987-88. However, in the year 1992-93 its share increased tremendously to 0.96 per cent.

This shows that the engineering exports is positively related to GNP, NNP and GDP. There exists a positive correlation between engineering exports and other variables such as total exports, GNP, NNP and GDP. All the correlation coefficients were found to be greater than 0.90, and highly significant at one per cent level. Among these the correlation coefficient between engineering exports and total exports is 0.99, engineering exports and GNP 0.95, engineering exports and NNP 0.95 and engineering exports and GDP 0.95. Its contribution also increased over the years regarding GNP, NNP and GDP.

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1. Government of India, Ministry of Finance, Economic Survey, 1993-94, p.88.

Table 5.7: Percentage Share of Engineering Exports to GDP at Current Prices

Year	Engineering exports	GDP at current prices	Percentage share of Eng. exports to GDP at current prices
1970-71	115.76	43163.00	0.27
1975-76	408.22	78761.00	0.52
1980-81	874.17	136013.00	0.64
1981-82	1046.98	159760.00	0.66
1982-83	1011.30	178132.00	0.57
1983-84	1000.00	207589.00	0.48
1984-85	1155.00	231387.00	0.50
1985-86	1095.00	261920.00	0.42
1986-87	1203.73	291974.00	0.41
1987-88	1355.00	332616.00	0.41
1988-89	1589.00	395779.00	0.40
1989-90	2350.00	456820.00	0.51
1990-91	3500.00	532030.00	0.66
1991-92	5025.00	615655.00	0.82
1992-93	6780.00	705566.00	0.96

Source: Compiled from

1. Engineering Expert Promotion Council Data Sheet, various issued, Calcutta.
2. Reserve Bank of India, _Annual Report on Currency and Finance_ (Various issues), Bombay.

When exports are measured as percentages of GNP, NNP and GDP of a country, they indicate the extent of the dependence of the country on the world market. The rising percentage of engineering exports in the GNP indicates that the engineering sector of Indian economy is becoming less dependent on the world economy.

The preceding paragraphs clearly crystallised that the engineering goods exports have a healthy progress. Though India has a good record of growth in exports, many stringent policies of the foreign countries and the industrial recession in developed countries had an adverse impact upon the overall development of Indian economy. To overcome the domestic and the global problems, which are stagnating the engineering exports, along with the liberalisation policy a long term policy for export promotion ought to be formulated.

Apart from formulating a long term policy, the government should insist upon the industry to produce high quality goods which will be acceptable in the competitive world market. This is evident from countries like China, Japan, Germany etc. Within a short period of time, these countries have reached an appreciable progress in their economy. It is very high time to review our export policy in general with special emphasis on the engineering exports by which we may be able to handle the balance of payment crisis and to find a favourable solution for that.

CHAPTER VI

COMMODITY-WISE ANALYSIS OF ENGINEERING EXPORTS

In Indian Engineering Industry has played a pivotal role in the industrial resurgence of India since independence. The steady growth and diversification of engineering goods exports during the period of a little over four decades is symptomatic of the impressive progress achieved by the industry.

The remarkable growth in the value and the quantum of the country's exports is due to the significant expansion in the range of engineering items being exported from the country. It is a tribute to the growth and maturity that the industry has demonstrated in terms of quality and sophistication. Today the industry has attained a dynamic dimension and capability unequalled and unrivalled anywhere in the developing world with an exhaustive export list that ranges from such minor items as the small pins, hand tools and auto parts to a wide assortment of machine tools, electrical and electronic goods, steel and non-ferrous products, forgings and castings, besides an array of heavy engineering items that include industrial plant and machinery, fabricated steel structures, cars, jeeps, trucks, wagons, tractors and farm implements, two-wheelers and three-wheelers, coastal ships and vessels to mention a few.

The other products that figure high among the exportable goods are bicycles, sewing machines, electric fans, iron and steel tubes and other consumer durables. Analysis of the trend in the engineering exports since independence shows that the share of engineering exports to total exports is making good progress. The qualitative change in the export profile of the engineering industry is represented by the fact that capital goods export now dominates the export composition. But in spite of the impressive growth of the engineering exports over the last four decades, the share of engineering exports to engineering production is barely five per cent and, again in the export map of the world, India's share is less than one per cent.

In the late fifties and early sixties the engineering exports of India consisted mainly of metal manufactures like steel pipes, steel wires and other products. However, the export pattern witnessed a radical shift over time since 1966-67. There has been a considerable increase in the exports of non-traditional items within the category of engineering exports.

In line with the changes in the world demand pattern, new items were born and established themselves as important exportables. Their share has been on the rise. Simultaneously the share of some traditional items of engineering goods have declined during the same period. These broad trends in commodity composition of engineering product exports show that the country's engineering exports now consists of more sophisticated items and that considerable commodity diversification has taken place in their exports over the period.

Export Diversification

Of the 98 commodity groups listed by the Engineering Export Promotion Council (EEPC) in its Export Statistics for 1992-93, 51 commodities were present in the list of exportables in 1956-57 and 61 commodities in 1960-61. This means that at least 40 per cent of the commodity groups started their life as exportables only after 1960-61. And it is a clear indication of commodity diversification.

For expository convenience, the engineering exports are divided into the following five commodity groups - broadly, the commodity classification is similar to the one adopted by the EEPC and Confederation of Engineering Industry (CEI).[1]

1) Capital goods
2) Primarily steel and pig iron based items,
3) Non-ferrous products
4) Consumer durables and
5) Management and consultancy services.

This commodity grouping is done by taking into account the nature of the commodities and the value added per unit of raw material used in the production of the commodities.

The value added per unit of raw material in the production of capital goods and consumer durables will be more than that in the production of primarily steel and pig iron based items and non-ferrous metals. It is but natural that the value added in capital goods will be more than the

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1. As per the classification followed by the Confederation of Engineering Industry and the Engineering Export Promotion Council, this sector excludes the electronic and computer software.

consumer durables. Within this broad commodity classification, any shift from primarily steel and pig iron based items and non-ferrous metal products to capital goods and consumer durables is indicative of commodity diversification. It also represents a shift from items with low value added and high raw material content to commodities with high value added and low raw material content.

A sector-wise analysis since 1970-71 brings out the shift in the structure of India's export.

Capital Goods

It is a matter of great consolation that India is exporting not only small or consumer durable engineering goods but capital goods also, which are equally required for the infrastructure of the country. These include industrial plant and machinery, electric power machinery, switch gears, Transmission line towers, wagons and coaches, coastal vessels and complete vehicles etc.

India is not only exporting capital goods but have acquired a high degree of sophistication in the production of these goods also. In the year 1955-56, India exported capital goods worth Rs.0.62 crore which was just 12.1 per cent of the total export of the engineering goods. But after the passing of the sixties, the scene was almost changed. In the year 1973-74, the export of the capital goods amounted to Rs.63.89 crore against the total export of Rs.193.47 crore which was 32.6 per cent of the total exports.

The year 1989-90 proved to be a boon to the capital goods exports in terms of the percentage share which was 38.7 per cent of the total engineering exports. In the year 1993-94, although the percentage share went down to 27.62 per cent the monetary value realisation rose from Rs.906.60 crore to Rs.2430 crore (See Table 6.1).

In Table 6.1, we considered capital goods as a single unit. Now let us analyse independently some selected items of the capital goods which are being exported by India. The following are the major items in the export list of capital goods (See Table 6.2).

Industrial Plant and Machinery

India, to a large degree, is now capable of exporting heavy industrial plants such as textile

Table 6.1: Engineering Goods Exports-Sectoral Composition

(Rs. in crore)

Year	Capital goods	Non-ferrous products	Primarily steel based items	Consumer durables	Software	Management and consult-ancy services	Total engineering exports
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1955-56	0.62 (12.1)	1.10 (21.3)	1.70 (3.29)	1.74 (33.7)	-- --	-- --	5.16 (3.41)
1971-72	50.46 (40.3)	4.49 (3.6)	23.92 (19.1)	46.40 (37.0)	-- --	-- --	125.27) (100.0)
1972-73	54.40 (38.6)	5.36 (3.8)	28.07 (19.9)	53.25 (37.7)	-- --	-- --	141.78) (100.0)
1973-74	63.89 (33.0)	9.14 (4.7)	45.59 (23.6)	74.85 (38.7)	-- --	-- --	193.47 (100.0)
1974-75	111.63 (32.0)	11.58 (3.3)	95.73 (27.4)	130.17 (37.3)	-- --	-- --	349.11 (100.0)
1975-76	155.23 (38.17)	15.53 (3.8)	80.44 (19.7)	157.02 (38.4)	-- --	-- --	408.22 (100.0)
1976-77	177.27 (32.1)	35.66 (6.5)	152.44 (27.6)	186.31 (33.8)	-- --	-- --	551.68 (100.0)
1977-78	206.51 (33.1)	24.81 (4.0)	159.74 (25.6)	232.90 (37.3)	-- --	-- --	623.96 (100.0)
1978-79	259.94 (36.3)	28.33 (4.0)	170.99 (23.9)	257.67 (35.9)	-- --	-- --	716.93 (100.0)
1979-80	283.65 (38.5)	30.14 (4.1)	149.51 (20.3)	273.66 (37.1)	-- --	-- --	736.68 (100.0)

(Contd.)

Table 6.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1980-81	304.40 (34.8)	54.55 (6.2)	148.76 (17.0)	366.46 (41.9)	-- --	-- --	874.17) (100.0)
1981-82	366.38 (35.0)	34.23 (3.3)	170.87 (16.3)	410.51 (39.2)	-- --	65.00 (16.2)	1,046.99 (100.0)
1982-83	360.36 (35.6)	35.09 (3.5)	137.29 (13.60)	386.96 (38.6)	13.60 (1.3)	75.00 (7.4)	1,011.30 (100.0)
1983-84	355.00 (35.5)	23.00 (2.3)	150.00 (15.0)	382.00 (38.2)	18.00 (1.8)	72.00 (7.2)	1,000.00 (100.0)
1984-85	378.75 (32.79)	28.75 (2.42)	175.50 (15.19)	462.00 (40.00)	25.00 (2.16)	85.00 (7.96)	4,155.00 (100.0)
1985-86	400.88 (36.60)	38.74 (3.53)	126.36 (11.54)	349.09 (31.88)	115.00 (10.50)	65.00 (5.94)	1,095.07 (100.0)
1986-87	449.07 (37.31)	37.27 (3.09)	122.90 (10.21)	382.49 (31.77)	160.00 (13.29)	52.00 (4.32)	1,203.73 (100.0)
1987-88	446.00 (32.92)	29.00 (2.14)	145.75 (10.76)	433.75 (32.01)	250.00 (18.45)	50.00 (3.69)	1,355.00 (100.0)
1988-89	593.75 (37.37)	49.50 (3.12)	254.75 (16.03)	601.00 (37.82)	-- --	90.00 (5.66)	1,589.00 (100.0)
1989-90	906.60 (38.58)	65.00 (2.76)	415.00 (17.66)	830.00 (35.32)	-- --	135.00 (5.74)	(2,350.00) (100.0)
1990-91	1,250.00 (35.71)	225.00 (6.43)	800.00 (22.86)	1,025.00 (29.29)	-- --	200.00 (5.71)	3,500.00 (100.0)

(Contd.)

Table 6.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1991-92	1,715.00 (34.13)	405.00 (8.06)	1,220.00 (24.28)	1.410.00 (28.06)	-- --	275.00 (5.47)	5,025.00 (100.0)
1992-93	2,035.00 (30.01)	635.00 (9.37)	1,910.00 (28.17)	1,755.00 (25.88)	-- --	445.00 (6.56)	6,780.00 (100.0)
1993-94	2,430.00 (27.62)	590.00 (6.70)	3,050.00 (34.68)	2,140.00 (24.33)	-- --	585.00 (6.65)	8,795.00 (100.0)

Note: Figures in the parentheses are percentages.

Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta

machinery, jute machinery, cement plants, food processing, plants etc. The industrial plant and machinery have been classified into five heads:

a) Jute, textile and knitting machinery
b) Sugar machinery
c) Cement machinery
d) Food machinery
e) Excavators, tractors and earth moving equipments

Jute, Textile and Knitting machinery constitute a major portion in the export list of the capital goods. India exports all types of jute, textile and knitting machinery and their spare parts. This item is not new to India's export list. In the year 1956-57 India exported jute, textile and knitting machinery worth Rs.0.028 crore, which was about 0.5 per cent of the overall engineering exports. In the year 1975-76, the export figure touched the highest level ever recorded, Rs.22.79 crore. After 1985-86, the export figure has been increasing considerably. In the year 1992-93, India could export jute, textile and knitting machinery of Rs.185 crore (See Table 6.2).

Table 6.2: Itemwise Engineering Exports of India: Capital Goods

(Rs. in crore)

Sl.No. Commodities	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
A. CAPITAL GOODS						
1) Industrial Plant and Machinery	107.58 (10.64)	159.25 (15.93)	182.00 (15.76)	158.82 (14.50)	188.50 (15.66)	165.75 (12.23)
a) Textile & Knitting Machinery	--	--	--	30.12	42.65	40.75
i) Textile machinery & jute	15.34	13.50	21.50	27.94	37.69	35.50
ii) Synthetic fibre machinery	--	--	--	1.00	0.85	3.00
iii) Knitting machinery	--	--	--	1.18	4.12	2.25
b) Sugar, Cement, Chemicals etc.	28.29	6.75	76.50	21.49	33.70	27.50
i) Sugar	3.41	8.80	14.50	3.39	7.50	1.00
ii) Cement	0.39	26.75	22.75	1.14	0.09	5.50
iii) Boilers etc.	19.17	18.00	16.75	18.50	11.91	14.00
iv) Chemical Plant including paper, pharmaceutical and water treatment etc.	5.32	2.50	14.50	5.37	14.20	7.00
c) Food Processing	11.72	15.75	27.25	20.25	19.12	12.00
d) Heating and cooling equipment	3.26	3.75	3.50	3.08	4.90	2.00

(Contd.)

Table 6.2 contd.

Sl.No.	Commodities	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
e)	Construction machinery including cranes	18.42	20.25	14.25	37.13	24.99	19.50
i)	Cranes and lifts	5.47	2.75	3.00	5.86	8.02	1.50
ii)	Earth moving and other construction machinery	12.95	17.50	11.25	15.90	3.30	13.00
iii)	Tractors	--	--	--	2.16	--	--
iv)	Agricultural implements	--	--	--	13.21	13.67	5.00
f)	Other industrial machinery	30.55	44.25	47.00	46.75	63.14	64.00
2)	Electric Power Machinery and and Switch Gear	35.43 (3.49)	30.50 (3.05)	29.75 (2.58)	21.07 (1.92)	43.36 (3.60)	34.00 (2.51)
i)	Alternator, Generators, transformers and other electric equipment	--	--	--	16.88	26.30	26.00
ii)	Power capacitors, conductors etc.	--	--	--	0.64	3.47	1.00
iii)	Electric motors	--	--	--	3.55	13.59	7.00
3)	Fabricated steel structures	18.72 (1.85)	26.00 (2.60)	20.75 (1.80)	20.75 (1.89)	22.70 (1.89)	22.00 (1.85)
i)	Marine freight containers	--	--	--	7.32	8.21	14.00
ii)	Fencing structures	--	--	--	6.14	4.28	5.50
iii)	Other steel structures fabricated	--	--	--	7.09	10.21	5.50

(Contd.)

Table 6.2 contd.

Sl.No. Commodities	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
4) Transmission Line Towers	22.97 (2.27)	21.25 (2.13)	19.50 (1.69)	7.72 (3.70)	3.55 (0.30)	5.00 (0.37)
5) Wire and Cables	46.22 (4.57)	27.50 (2.75)	34.00 (2.94)	43.20 (3.94)	37.40 (17.47)	48.50 (3.58)
6) Wagons and Coaches	14.32 (1.42)	7.00 (0.70)	15.00 (1.30)	11.69 (1.07)	17.40 (1.45)	3.50 (0.26)
7) Coastal vessels and ships	2.99 (0.30)	1.50 (0.15)	0.75 (0.06)	1.27 (0.12)	0.62 (0.05)	33.50 (2.48)
8) Complete vehicles	75.17 (7.43)	43.25 (4.33)	66.50 (5.76)	53.04	42.50	52.00
9) Machine tools	32.65 (3.23)	26.75 (2.68)	23.50 (2.03)	59.78 (5.50)	65.59 (5.45)	66.50 (4.91)
10) Aircrafts and spares	4.41 (0.44)	12.00 (1.20)	1.00 (0.35)	20.66 (1.89)	13.64 (1.13)	5.75 (0.42)
TOTAL	360.36	355.00	378.75	400.88	449.07	446.00

(Contd.)

Table 6.2 conted.

Sl.No. Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
A. CAPITAL GOODS						
1) Industrial Plant and Machinery	275.75 (17.35)	397.85 (16.93)	514.00 (14.69)	614.00 (12.22)	740.00 (10.97)	795.00 (9.04)
a) Textile & Knitting Machinery	92.25	135.00	156.00	156.00	185.00	158.00
i) Textile machinery & jute	90.00	133.00	150.00	148.00	177.00	145.00
ii) Synthetic fibre machinery	--	--	--	--	--	--
iii) Knitting machinery	2.5	2.00	6.00	8.00	8.00	13.00
b) Sugar, Cement, Chemicals etc.	42.50	62.6	110.00	163.00	180.00	845.00
i) Sugar	1.25	0.65	8.00	5.75	11.50	18.00
ii) Cement	1.25	0.20	0.75	0.25	5.50	1.25
iii) Boilers etc.	19.00	16.75	22.00	45.00	37.50	55.00
iv) Chemical Plant including paper, pharmaceutical and water treatment etc.	21.00	45.00	79.25	112.00	125.50	170.70
c) Food Processing	21.00	33.00	40.00	43.00	52.00	52.00
d) Heating and cooling equipment	6.00	16.25	13.25	20.00	28.00	22.00

(Contd.)

Table 6.2 contd.

Sl.No.	Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
e)	Construction machinery including cranes	42.00	66.00	77.00	57.00	85.00	88.00
i)	Cranes and lifts	12.50	11.50	25.00	22.00	40.00	45.00
ii)	Earth moving and other construction machinery	21.25	43.50	32.00	35.00	45.00	43.00
iii)	Tractors	--	11.00	20.00	30.00	45.00	62.00
iv)	Agricultural implements	8.25	--	--	--	--	--
f)	Other industrial machinery	72.00	85.00	117.75	145.00	165.00	168.00
2)	Electric Power Machinery and and Switch Gear	36.00 (2.77)	48.00 (2.04)	85.00 (2.42)	105.00 (2.09)	170.00 (2.51)	240.00 (2.73)
i)	Alternator, Generators, transformers and other electric equipment	--	--	--	--	--	--
ii)	Power capacitors, conductors etc.	--	--	--	--	--	--
iii)	Electric motors	--	--	--	--	--	--
3)	Fabricated steel structures	32.50 (2.05)	68.00 (2.89)	125.00 (3.57)	154.00 (3.06)	210.00 (3.1)	250.00 (2.84)
i)	Marine freight containers	16.50	43.25	81.00	78.75	122.00	141.00
ii)	Fencing structures	7.25	16.50	10.00	14.75	25.00	34.00
iii)	Other steel structures fabricated	8.75	8.25	34.00	60.50	63.00	75.00

(Contd.)

Table 6.2 contd.

Sl.No. Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
4) Transmission Line Towers	2.25 (0.14)	18.00 (0.77)	41.00 (1.17)	54.00 (1.07)	100.00 (1.47)	90.00 (1.02)
5) Wire and Cables	61.00 (3.84)	88.00 (3.74)	88.00 (2.51)	90.00 (1.79)	60.00 (0.88)	43.00 (0.49)
6) Wagons and Coaches	3.50 (0.22)	11.85 (0.50)	5.25 (0.15)	8.00 (0.16)	5.50 (0.08)	24.00 (0.27)
7) Coastal vessels and ships	6.75 (0.42)	0.15 (0.01)	66.50 (1.90)	50.00 (1.0)	2.50 (0.04)	4.00 (0.05)
8) Complete vehicles	103.00 (6.48)	196.00 (8.34)	225.00 (6.44)	500.00 (9.96)	620.00 (9.14)	820.00 (9.32)
9) Machine tools	68.00 (4.28)	74.75 (3.18)	85.25 (2.44)	100.00 (1.99)	100.00 (1.47)	127.00 (1.44)
10) Aircrafts and spares	4.50 (0.28)	4.00 (0.17)	14.50 (0.41)	40.00 (0.80)	27.00 (0.40)	37.00 (0.48)
TOTAL	593.75	906.6	1,250.00	1,715.00	2,035.00	2,430.00

Note Figures in the parentheses are percentages.
Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta

During the year 1990-91 the demand for the textile machinery, the world over has picked up considerably, but the Indian machinery manufacturers have not been able to cash on this opportunity. A part of the explanation, of course, lies in the fact that the internal demand has broadened in the wake of the improvement in the financial position of the cotton textile industry and the implementation of the soft loan scheme.

So far as the world market is concerned, India exports these machines not only to the Gulf countries or Asian countries, but also to the developed countries such as the USSR, Holland, Belgium, USA, Canada etc. Bangladesh is the biggest market for the Indian textile machinery. It has many advantages of importing the textile machinery from India. First and foremost amongst them is the low transportation cost.

Sugar plant and mill machinery (India being a prominent sugar producing country) has acquired a high degree of sophistication in the production and export potential. The export history of sugar mill machinery can be traced back as early as 1956-57, when India exported sugar mill machinery worth Rs.0.025 crore, which was less

Table 6.3: Export of the Industrial Plant and Machinery

(Rs. in crore)

Year	Exports of Industrial Plant & Machinery	Exports of capital goods	% share of Col. 2 to Col.3
1973-74	15.96	63.89	24.98
1974-75	31.23	111.63	27.98
1975-76	45.53	155.23	29.31
1976-77	43.19	177.27	24.36
1977-78	45.42	206.51	21.99
1978-79	60.48	259.94	23.26
1979-80	66.52	286.65	23.21
1980-81	93.00	304.40	30.55
1982-83	107.58	360.36	29.85
1983-84	159.25	355.60	44.85
1984-85	182.00	378.75	48.43
1985-86	158.82	400.88	39.61
1986-87	188.50	449.07	41.97
1987-88	165.75	446.00	37.16
1988-89	275.75	593.75	46.44
1989-90	395.85	906.60	43.66
1990-91	514.00	1250.00	41.12
1991-92	614.00	1715.00	35.80
1992-93	740.00	2035.00	36.36
1993-94	795.00	2430.00	32.71

Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta

than 0.05 per cent of its total export of the engineering goods. The year 1971-72 marked a turning point when India exported this item worth Rs.1.11 crore. Again in 1992-93, Indian exports of sugar mill machinery amounted to Rs.11.50 crore. In the year 1993-94, India attained an all time high record of export viz. Rs.18 crore. All sugar producing countries, except Canada, today import sugarcane crushers from India. This includes the countries like Indonesia, Malaysia, USA, Fiji, Trinidad and Nigeria.

Tractors and their Parts

Like the agriculturally advanced countries, India today exports a number of agricultural equipments. Tractors and excavators rank first in that list. The Ferguson, Zeter and the Hindustan are a few names of tractors, which are exported from India. India started the export business of Tractors and their parts and excavators from 1964-65, when export value amounted to Rs.015 crore. In the year 1993-94, the exports touched an all time high record of Rs.6.2 crore (See Table 6.2). Our main competitor in this field is North Korea. Due to this, India is lost many markets. The markets that India lost in this case are Bangladesh, Nepal, Zambia, Kuwait, Australia etc. Bangladesh stopped importing tractors and parts. The developed countries, like UK, USA, Germany and France import mainly the parts instead of tractors. Gulf region can prove to be a good and promising market for the Indian tractors since these countries are now concentrating themselves on the agricultural front.

Electric Power Machinery and Switchgear

India today exports power machinery and switchgears also. In the electric power machinery, India exports mainly electric control gear, transformers, circuit brakers, generators and alternators, pump sets, motor starters etc. The quality of Indian goods is so good that India is able to export to all the important countries of the world whether they are highly developed or developing or under developed.

India has started exporting electric power machinery in 1956-57, the total export value of electric power and switchgear machinery was Rs.14.87 crore. This figure slightly improved and in 1993-94, the Indian exports of electric power machinery and switchgears amounted to Rs.240 crore, which was nearly 9.87 per cent of capital goods exports (See Table 6.4).

Table 6.4: Export of Electrical Power Machinery and Switchgear

(Rs. in crore)

Year	Exports of Electrical Power Machinery and Switchgear	Exports of capital goods	% share of total export of capital goods
1956-57	neg	0.62	--
1960-61	0.028	1.04	--
1965-66	0.14	5.45	--
1970-71	3.36	48.98	6.85
1973-74	6.05	63.89	9.47
1974-75	11.99	111.63	10.74
1975-76	14.87	155.23	9.58
1976-77	15.60	177.27	8.80
1977-78	20.31	206.51	9.83
1978-79	28.00	259.94	10.77
1979-80	34.44	286.65	12.01
1980-81	36.00	304.40	11.83
1982-83	35.33	360.36	9.80
1983-84	30.50	355.00	8.59
1984-85	29.75	378.75	7.85
1985-86	21.07	400.00	5.27
1986-87	43.36	449.07	9.66
1987-88	34.00	446.00	7.62
1988-89	36.00	593.75	6.07
1989-90	48.00	906.60	5.29
1990-91	85.00	1250.00	6.80
1991-92	105.00	1715.00	6.12
1992-93	170.00	2035.00	8.35
1993-94	240.00	2430.00	9.87

Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta

The item-wise analysis of electric power machinery group shows that electric transformers and their parts are the highest foreign exchange earning items for India. The second and equally important export item in this group is the electric control-gear and the switchgear. The electric generators and alternators also formed an equally important export item of the group.

The prominent importing countries of these items are Malaysia, France, Kenya, Singapore, Saudi Arabia, Bahrein and Germany. Libya is the biggest importer of generators. Most of the countries in West Asia and Gulf region are importers of electric generators and alternators.

Transmission Line Towers and Poles

It was only during 1959-60 that India could enter the world market for Transmission line towers and poles. This item is generally used in the telecommunication process, and micro waves. The countries, where construction projects are underway on a large scale and where India is undertaking projects, provide good opportunities for the export of Transmission line power and poles. India has been undertaking various projects in the Gulf region. That is why the countries like Kuwait, Libya, UAE, Iraq etc. have proved to be the promising and potential markets for the Transmission line towers.

In the year 1966-67, India exported Transmission line towers wwrth Rs.0.56 crore, while this figure rose to Rs.13.35 crore in the year 1977-78. After 1984-85, the export figure has been declining considerably. In the year 1988-89, India could export Transmission line towers and poles of only Rs.2.25 crore. The fall in the export of Transmission line towers could be largely attributed to the overall depression in the global Transmission line towers industry.

In the year 1992-93, India exported these items worth Rs.100 crore, which was nearly 4.91 per cent of total export of capital goods (See Table 6.5).

India has to attain a high degree of sophistication in the manufacture of the towers and poles since China and Japan have emerged as the close competitors in the field of Transmission line towers. In the years to come, the Gulf, Africa and West Asia will be the potential markets for Transmission line. Hence, it is the need of the hour to tap the opportunity. India had an edge over

Table 6.5: Export of Transmission Line Towers and Poles

(Rs. in crore)

Year	Exports of Transmission Towers and Poles	Exports of capital goods	% share of total export of capital goods
1956-57	--	0.62	--
1960-61	--	1.04	--
1965-66	0.17	5.45	--
1970-71	2.87	48.98	5.85
1973-74	2.44	63.89	3.82
1974-75	5.12	111.63	4.59
1975-76	7.35	155.23	4.73
1976-77	8.98	177.27	5.07
1977-78	13.35	206.51	6.46
1978-79	8.61	259.94	3.31
1979-80	13.34	283.65	4.70
1980-81	19.00	304.40	6.24
1982-83	22.97	360.36	6.38
1983-84	21.25	355.00	5.98
1984-85	19.50	378.75	5.14
1985-86	7.72	400.88	1.92
1986-87	3.55	449.07	0.79
1987-88	5.00	446.00	1.12
1988-89	2.25	593.75	0.37
1989-90	18.00	906.60	1.98
1990-91	41.00	1250.00	3.28
1991-92	54.00	1715.00	3.14
1992-93	100.00	2035.00	4.91
1993-94	90.00	2430.00	3.70

Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta

her rivals due to the cheap labour cost which plays a vital role in the manufacture of Transmission line towers.

Complete Vehicles

Although India has been exporting automobile and auto parts since 1956, yet, so far as the export of complete vehicles is concerned, India is a late entrant in the world market. It was only in 1964-65, India started the export of automobiles complete. That year, the export of automobiles complete amounted to Rs.1.26 crore, which was just 5 per cent of the total engineering goods exports. In the year 1982-83, the export figure touched the commendable height of Rs.20.85 crore and after that faced a recession from 1983-84 to 1988-89. In the year 1993-94, India exported complete vehicles worth Rs.820 crore, which was 33.74 per cent of the total capital goods export (See Table 6.6).

If we take into account the commodity composition of automobiles complete which are being exported from India, we will find that today India exports each and every type of automobile vehicles, complete in every respect, to all important countries of the world. Today India exports the following automobiles complete.

Table 6.6: Export of Complete Vehicles
(Rs. in crore)

Year	Exports of Complete Vehicles	Exports of capital goods	% share of total export of capital goods
1956-57	--	0.62	--
1960-61	--	1.04	--
1965-66	1.16	5.45	19.00
1970-71	14.01	48.98	28.61
1973-74	6.13	63.89	9.59
1974-75	16.56	111.63	14.83
1975-76	24.49	155.23	15.78
1976-77	31.91	177.27	20.24
1977-78	40.97	206.51	19.83
1978-79	45.00	259.94	17.31
1979-80	56.98	283.65	20.08
1980-81	65.00	304.40	21.35
1982-83	75.17	360.36	20.85
1983-84	43.25	355.00	12.18
1984-85	66.50	378.75	17.59
1985-86	53.04	400.88	13.22
1986-87	42.50	449.07	9.46
1987-88	52.00	446.00	11.65
1988-89	103.00*	593.75	17.36
1989-90	196.00*	906.60	21.63
1990-91	225.50*	1250.00	18.04
1991-92	500.00*	1715.00	29.15
1992-93	620.00*	2035.00	30.46
1993-94	820.00*	2430.00	33.74

* including motor cycles.

Source: Compiled from Engineering Export Promotion Council Data Sheet , various issues, Calcutta

a) Automobile buses and lorries

b) Ambulance, cars and vans

c) Automobile cars and jeeps

d) Automobile chasis with engines

e) Auto Rickshaws

f) Automobile tankers

g) Automobile mopeds

h) Auto three-wheelers

i) Automobile mini buses

j) Fork-lift trucks and parts

k) Automobile truck with cadder

l) Scrappers

m) Motor-cycles and

n) Motor-scooters.

Automobile buses and lorries are the highest foreign exchange earners in the automobile complete group.

There are three potential regions for the Indian buses and lorries: (1) The Gulf region, (2) The South East Asia, and (3) Africa. In the Gulf region, Bahrain, Kuwait, Oman, Qatar and United Arab Emirates are the potential countries. "Thanks to the steady climb of the Yen against the dollar. The sale of Japanese cars has decreased in the

Gulf. Cashing in on lower prices with comparable features, the Korean makes have emerged as important sellers in the Gulf. Thanks to the price advantage, Indian cars are also staking their right of way in Gulf". (The Hindu, 1995). In the South East Asia, countries like Bangladesh, Burma, Indonesia, Malaysia, Nepal, Singapore and Sri Lanka are the major importers of Indian buses and lorries. Indonesia and Sri Lanka are considered to be very promising markets. In the African region, Ethiopia, Kenya, Tanzania, Uganda, Zambia, Egypt, Sudan, Ghana and Nigeria are the promising markets for Indian buses and lorries.

So far as the other types of the automobiles complete, viz., the ambulance cars and vans, India could not make much breakthrough in her exports. Automobile cars and jeeps are also in the world market and their export has earmarked a very good reputation. Mahindra and Mahindra, Premier automobiles and Hindustan Motors are playing a pioneer role in the export business of cars and jeeps.

In the automobile complete group, automobile chassis with engines has also acquired a responsible market. In the automobile group, automobile chassis with engines is the second highest foreign exchange earner.

Another prominent item of the group is the motor scooters. Bajaj, Vijay Super and LML Vespa are in the export list of scooters. Indian motor cycles are also very popular in the world market. Australia, USA, Canada, Italy, Holland, Germany, France and Belgium are the prominent markets amongst the developed countries importing Indian motor cycles.

Indian automobile component manufactures should gear up to cash in on the export potential offered by European and US manufacturers, who are oursourcing upto 70 per cent of their components. The extent of outsourcing is expected to go upto 90 per cent by the turn of the century, according to a report "Perspectives for Indian Automotive Suppliers" prepared by a German Consultancy firm (Lijee Varghese, 1995).

Wires and Cables

Wires and cables is an important export commodity in the capital goods group. Today India is exporting a large variety of electric wires and cables which are as follows:

a. Bare aluminium conductors

b. Bare copper conductors

c. Insulated cables and wires

d. Copper winding wires

e. Copper earth wires (M/T) and

f. Winding wires.

All these above mentioned wires and cables are used in electricity fittings in buildings, machines and other constructions. Although India could start the export of wires and cables as back as 1956-57, a major breakthroqgh was made in the year 1970-71, when Indian exports were valued at Rs.11.32 crore. In the year 1991-92, the export of wires and cables was recorded as high as Rs.90 crore, which was 7 per cent of the total capital goods exports (See Table 6.7).

If we observe the above mentioned export data, mainly commodity-wise, we will find that two items - (1) Bare aluminium conductors and (2) Insulated cables and wires, dominate the export of wires and cables and fetch more than 95 per cent of the total export earnings from wires and cables.

So far as the geographical distribution of the export of wires and cables is concerned, South East Asia,

Table 6.7: Export of Wires and Cables

(Rs. in crore)

Year	Exports of Wires and Cables	Exports of capital goods	% share of total export of capital goods
1956-57	0.01	0.62	1.01
1960-61	0.03	1.04	2.88
1965-66	1.17	5.45	21.46
1970-71	11.32	48.98	23.11
1973-74	11.54	63.89	18.06
1974-75	17.25	111.63	15.40
1975-76	21.18	155.23	13.60
1976-77	23.82	177.27	13.40
1977-78	29.82	206.51	14.43
1978-79	20.83	259.94	8.01
1979-80	13.29	283.65	4.68
1980-81	16.00	304.40	5.25
1982-83	46.22	360.36	12.82
1983-84	27.50	355.00	7.74
1984-85	34.00	378.75	8.99
1985-86	43.20	400.88	10.80
1986-87	37.40	449.07	8.32
1987-88	48.50	446.00	10.76
1988-89	61.00	593.75	10.20
1989-90	88.00	906.60	9.70
1990-91	88.00	1250.00	7.04
1991-92	90.00	1715.00	5.24
1992-93	60.00	2035.00	2.94
1993-94	43.00	2430.00	1.76

Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta

Gulf region and Africa along with certain advanced European countries are the major trading partners. The erstwhile USSR was the biggest importer of the Indian wires and cables which alone imported between 25 and 30 per cent of the total Indian exports. At present we are not in a position to export the expected quantity of wires and cables to CIS because of the disintegration of USSR. This is the reason for the decline in the percentage share of the wires and cables in the export of capital goods. Other prominent countries are Kuwait, Bahrain, United Arab Emirates, Mauritius etc.

Wagons and Coaches

Despite having the Third largest railway system in the world, having an annual production capacity of 40,000 wagons and having the best team of railway engineers and technicians, the export performance of wagon industry in India has been the most disappointing. It was in 1967-68, when India made a break-through in the export of wagons when it exported wagons worth Rs.2.26 crore. In the year 1975-76, the export of wagons increased to Rs.17.23 crore, which was 11 per cent of the total capital goods export. During 1993-94 the exports of wagons and coaches again went upto Rs.24 crore.

Machine Tools

India can feel proud of her machine tools industry today. The Hindustan Machine Tools, Bangalore and Ajmer are the two pioneer machine tools manufacturing units in the public sector which have brought the Indian machine tools industry on the world map and a force to reckon with. Machine tools are the mother of machine. So called, because, unlike other machines, they can reproduce themselves. For example, a lathe or a milling machine is used to manufacture a lathe or a milling machine unlike a loom which cannot manufacture another loom.

During the last three decades, the machine tool industry in India has achieved an impressive growth and established a sound base for the manufacture and supply of machine tools to the engineering and other industries. There are about 160 machine tool manufacturing companies in the organised sector and approximately 300 units in the small and ancillary sectors. Its user industries constitute critical sectors of the economy such as industrial machinery, textile machinery, automobile components and a host of others.

The growth of the Indian machine tool industry over the last 15 years has been quite impressive. The value of output increased from Rs.1,860 million in 1980 to Rs.6,409 million in 1993 (See Table 6.8). This shows an annual average growth rate of the order of 15 per cent and exports have almost trebled by registering an average yearly growth of 14 per cent. However, the overall production and exports are far short vis-a-vis the size of the country and needs of the industrial sector in terms of quantity, technology and quality.

"The after-sales service facilities and financial packages offered by Indian exporters of machine tools has not matched the needs of the importing countries. Unfortunately poor quality of Indian exports is widely acknowledged complaint in spite of the existence of Export Inspection Council" (Bhatia, 1988).

The machine tools industry received a real boost in the 1970s when the automobile sector started growing. For instance, the eighties witnessed the development of the fuel efficiency concept in the automobile sector. The auto industry took rapid strides into high-volume production

Table 6.8: Production, Exports, Imports and Consumption of Machine Tools Industry

(Rs. in million)

Year	Production	Imports	Exports	Consumption	% Share of production to consumption	% Share of exports to production
1960	58.6	209.4	--	268.0	21.9	--
1970	372.3	183.0	27.8	527.4	70.6	4.47
1975	1859.5	440.5	81.8	1399.0	74.9	7.86
1980	1859.5	1048.4	208.5	2699.0	68.9	11.21
1981	2342.2	1100.0	232.5	3209.7	73.0	9.93
1982	2665.1	1200.0	241.62	3629.7	73.6	9.06
1983	2000.0	1500.0	250.0	3750.0	66.6	12.50
1984	2827.0	1616.0	202.0	4241.0	66.6	7.16
1985	3420.0	1550.0	300.0	4680.0	73.1	8.77
1986	3717.0	1750.0	464.0	5003.0	74.0	12.48
1987	4173.0	2000.0	699.0	5474.0	76.0	16.75
1988	4632.0	2000.0	460.0	6172.0	75.0	9.93
1989	5550.0	2000.0	800.0	6750.0	82.2	14.41
1990	6990.0	2250.0	1390.0	7850.0	89.0	19.89
1991	7750.0	3400.0	1250.0	9900.0	78.3	16.13
1992	7841.0	4811.0	500.0	12152.0	64.5	6.38
1993	6409.0	4649(e)	265.0	10793(e)	59.4	4.13

Source: 1. Annual Survey of Indian Machine Tools Manufactures Association, New Delhi.
2. Southern Economist (1995), Vol.23, No.22, 15 March, p.11.

phase and this had its effect felt on other engineering manufacturing activities as well.

At a time when there is a growing awareness that the Indian machine tool industry will probably fill up the vacuum likely to be created by the slow withdrawal of the European machine tool manufacturers in the area of general purpose machine tools, concerted efforts are needed to produce technologically sophisticated tools that will meet the requirements of the domestic as well as the export markets in the coming years.

Computer Numerical Control Machine Tools

The 1980s placed new demands on the machine tools industry. The auto sector gave priority to fuel efficiency, speed and power. Most of the machine tool user industries embarked on modernisation programmes to cope with the sudden spurt in demand. The machine tools industry did not hesitate to make the best use of the new opportunities. The most significant development was the growing popularity of Computer Numerical Control (CNC) machine tools. The users were educated on how CNC could streamline production, enhance quality and ensure flexibility to accommodate various jobs at short notice.

The CNC segment of the industry is making satisfactory progress. Their share in total production improved from 9 per cent in 1985 to 35 per cent in 1991. Production of CNC Machine tools increased from 560 numbers in 1990 to an estimated 600 numbers in 1991, a rise of 7 per cent. In terms of value the increase was from Rs.1370 million in 1990 to Rs.1700 million in 1991, a rise of 24 per cent (See Table 6.9). Exports rose from Rs.510 million in 1989 to Rs.1580 million in 1991. It is the profit margin that made the CNC segments attractive. No wonder, this segment, during the last six years, registered an average annual growth of 48 per cent.

Although India makes several types of CNC machines, most of them do not have the following advanced features, facilities and sensors:

1. Automated workpiece changing
2. Recognition of workpiece
3. Selection of part programme
4. Tool condition and tool life monitoring system
5. Tool management facilities
6. In process gauging for outline and active quality control

Table 6.9: Progress of Computer Numerical Control Machine Tools

Year	No. of CNC machine tools	Value in million of Rupees	Percentage share of CNC machines in (Group A) total
1985	93	190	9
1987	200	480	20
1988	282	670	24
1989	461	1050	31
1990	560	1370	33
1991	600	1700	35

Source: The Hindu Survey of Indian Industry (1991), p.339.

7. Electronic probes for tool and workpiece qualification
8. Facilities for thermal error compensation and
9. Management data acquisition system.

In fact, to keep pace with industrial sector's development and diversification programmes, the machine tool industry will have to go in for technology upgradation and diversification of its product-mix.

Imports

Although the Indian machine tools industry has travelled a long way on the technology road during the past four decades, it is yet far from the self sufficiency goal of meeting the needs of India's fast developing industries both engineering and others. Import of special purpose and precision machines has been continuing over the years in fairly large numbers as is seen from Table 6.8. During the last decade, the import of machine tools has been of the order of 33 per cent or more of its total consumption, going up in some years to as high as 40 per cent.

Almost half of the value of imports is accounted for by machine tools accessories/attachments. Other major imports consists of Gear Cutting Machines, Boring Machines, Lapping and Polishing machines. Grinders, Shapers, Slotters, Bending/Punching/Noching and Shearing machines, presses and other general purpose metal cutting/working machines such as Lathes, Milling and Drilling Machines etc. Besides these, high precision CNC Lathes and Grinders are also being imported in fairly large numbers. Amongst the accessories almost all machines tools manufactures use imported CNC system and components like AC/DC drives, controllers and ball screws etc.

Export Potential

India's potential as a major exporter of the most important segment of the Capital Goods Sector-machine tools - remains largely untapped. Over the last decade the share of exports in total production continues to hover around a meagre 10 per cent only. The collapse of the Russian economy, the Gulf war and slump in world trade due to the recession have been responsible for the slow progress on the export front. Exports declined from Rs.1390 million in 1990 to 265 million in 1993 (Table 6.8) The share of exports in total production declined from 19.89 per cent in 1990 to 4.13 per cent in 1993.

Exports of machine tools from India made their beginning way back in 1962 when machine tools of the value of Rs.11 lakh were exported. After an impressive performance in the late sixties and early seventies, the industry witnessed a slackening of export growth in subsequent years. India's export of machine tools in relation to world trade is even today insignificant. While the world consumption of machine tools is nearly Rs.23,000 crore per year, India's current exports are just a paltry 0.4 per cent of this volmme. The main reasons cited for such a poor performance are:

1. Lack of exportable surplus due to the Indian machine tools Industry's strong inclination towards meeting the domestic demand in preference to exports, as the margin in the later case is much less but the hassels involved are far too many.

2. Cost of production is comparatively very high making our machines uncompetitive, because of low productivity levels, high input costs, high incidence of taxes, costly imports infrastructural bottlenecks like power etc.

3. High dealer's margins inflate marketing costs. Export markets being highly brand conscious Indian machine tools do not get the same market response.

4. High incidence of inland rail freight and high ocean freight charges which with insurance is said to account for 32 per cent of the FOB value.

5. High costs of seaworthy packing and painting to export specifications.

6. Marketing promotion facilities abroad are totally unsatisfactory, if not missing, and

7. The quality and finish of our machines are comparatively poor.

Direction of Exports

In the sixties and seventies, the direction of exports were mainly confined to America and West European markets. With the commencing of trade with the Eastern Block, the picture changed drastically as these countries emerged as the major importers in the eighties. Correspondingly, the share of major developed importing countries - USA, Germany, Japan, Canada, UK and Australia - declined over the same period. The overall share of major developing countries - Nigeria, Kenya, Algeria, Iran, Iraq and Bengladesh also declined though at a relatively subdued pace. Compared to the seventies, when exports were more scattered, the subsequent decade witnessed a few countries accounting for a large proportion of the total machine tools exports. By 1990, USSR emerged as a major buyer accounting for 61 per cent of our total exports.

With the recent political and economic developments in the Soviet Union, East Europe and the pressingg need at home to increase exports to general currency area, the Rs.700 crore Indian Machine Tools Industry has felt the need to make efforts to explore the European market. Towards this end the Indian manufacturers are making bids to compete with China, Taiwan, Singapore and Hong Kong in the European market and are also offering the country as a base to sell and service European products.

As the domestic cost of production in Europe is very high many European companies have shown great keenness to sub-contract design and development work to Indian companies. The Indian firms are interested in upgrading their technology, diversifying into new lines and eventually entering into buy-back arrangements with their international partners.

As a first step in boosting exports to the EEC countries the Indian Machine Tools Manufacturers Association (IMTMA) held an exhibition of Indian manufactured machine tools. Further in order to tap the potential interest in Indian products, the Indian delegation of IMTMA visited several European Countries - Belgium, the Netherlands, Germany, Italy, France, Spain and Britain.

The machine tools industry, particularly the CNC segment, should produce machines of excellent quality in order to withstand competition from foreign companies. The process of production, assembly and design should be toned up. If necessary some of the vulnerable elements, which ensure reliability, should be imported.

The machine tools industry should take advantage of recent liberalisation of imports and reduction in customs duty. The government is laying stress on self-reliance. So the machine tools industry should concentrate on bridging the gaps in the technological sphere. Of course, there is nothing wrong in importing certain specialised types of machine tools which cannot be produced economically in our country. However, the industry has to pay special attention to productivity, cost quality and optimum cycle time.

The Indian machine tool industry is presently trying to rise from the ashes of the recession. The fortunes of the machine tool industry are directly linked to that of the entire economy in general and the engineerigg industry in particular. However, a steady growth in some of the other industries like automobiles and automotive components has, till now failed to bring signs of recovery in the Indian machine tool industry. Since recovery in the capital goods industry evolves with a lag; a resurgence in the user sectors is expected to prove favourable for the machine tool industry in the second half of 1994.

Mr.Shailesh Sheth, President, Indian Machine Tool Manufacturers Association, holds the view that the industry has passed through difficult times in the last two years owing to an 'unprecedented' demand recession in the country. The disintegration of the Soviet Union and the East European Socialist block also hit the industry's export trade.

Although India's machine tools industry has shown impressive growth in recent years, it has still a lot of leeway to make, considering the vast potential existing both in the domestic and world markets. The past performance of the industry bears adequate testimony to its dynamic nature and capability to meet the future demands of the manufacturing industry in the country. The current economic situation may be a temporary damper but the industry itself should be able to overcome such short term hurdles and take steps to meet the challenges of the nineties and beyond and attain the goal of self-reliance as soon as possible.

A number of measures had been announced earlier by the Government to ensure an accelerated rate of growth in the machine tool industry such as broad-banding and de-licencing. A pragmatic approach was adopted in granting approval for foreign collaborations etc.

The Government has introduced Technology Upgradation Scheme (TUS) for selected industries in the capital goods sector including machine tools. Specified machine tool items are allowed to be imported by these industries at a concessional rate of import duty of 40 per cent.

In addition to the above mentioned capital goods, India today exports steel structures fabricated in large volume. In these, India exports boilers, pressure vessels, heat exchangers, cranes and lifts. These are very heavy items and the main difficulty in their export is the non-availability of shipping space. In the year 1978-79, India exported steel structures worth Rs.51.56 crore, which was nearly double in comparison to 1977-78. In the year 1993-94, the export of steel structures (fabricated) increased to Rs.250 crore (See Table 6.3).

Industrialisation is the key to economic development of a country. As the process of industrialisation is associated with the development of technical and technological knowledge and skills which bring about a growth in productivity in all sectors including agriculture.

It is generally agreed that industrialisation is important but there has been no consensus on the pattern of industrial development. While Britain's industry stands testimony to a gradual growth over three stages of development, the Soviet Russia jumped from first to the third stage. India on the other hand choose a mid way. The second stage (production of consumer goods) and third stage (machine building, capital goods manufacturing) were ushered in together. For the then Prime Minister Shri Jawaharlal Nehru felt "it is only when India has acquired the ability to design, fabricate and erect its own plants without foreign assistance that it will have become a truly advanced and industrialised country".

The indigenous high technology capital goods industry is one of the most vital sectors of the economy. The capital goods industry is titled the engine of growth. It plays an important role in the national economy as it feeds every single sector, e.g. coal, steel, fertilizers, transportation, powers etc., and therefore, the level of technological sophistication and efficiency in capital goods sector passes on to the whole economy.

Today, we have a fairly well developed capital goods industry with an estimated output of about Rs.37,000 crore accounting for 16.3 per cent of the total industrial output. In terms of gross value added the share of capital goods is a little more than a fourth of all industry. The figure obtained for 1990-91 shows a growth rate of 15.5 per cent against all industry growth of 8.4 per cent during the same period. This is a commendable achievement against the constraints of credit squeeze, supply disruption, Gulf crisis, resource crunch, double digit inflation etc.

PRIMARY STEEL AND PIG IRON BASED ITEMS

The primary steel and pig iron based items offer good export prospects for two basic reasons, namely, we have the raw materials and we have abundant capacity for a much bigger production for export. If the need arises, there would be no problem in increasing the capacity without any investment. In the year 1978-79, this group contributed 25 per cent of the total export of engineering goods. While in the year 1993-94, the contribution of this group was increased to 34.68 per cent (See Table 6.10).

Let us discuss some of the important commodities separately. They are as follows:-

Steel Pipes and Tubes

In the aforesaid group, steel pipes and tubes occupy the top position in the export list. Steel pipes and tubes are used for carrying water, oil, gas etc. The pipes and tubes are also used in steel plants for refrigeration, or boiling purposes. Steel pipes and tubes contributed 25 per cent of the total export of this group

Table 6.10: Itemwise Engineering Exports of India: Primarily Steel and Pig Iron Based Items

(Rs. in crore)

Sl.No. Commodities	1982-83	1983-94	1984-85	1985-86	1986-87	1987-88
B. PRIMARY STEEL AND PIG IRON BASED ITEMS						
1. Steel pipes & tubes	20.87 (2.06)	15.75 (1.58)	15.75 (1.36)	16.75 (1.53)	11.62 (1.0)	28.00 (2.07)
2. Ferrous halloware	6.83 (0.68)	4.00 (0.40)	5.75 (0.50)	4.55 (0.42)	5.72 (0.48)	0.72 (0.05)
3. Steel wire & wire products	23.8 (2.35)	19.5 (1.95)	21.5 (1.86)	7.9 (0.72)	6.37 (0.53)	3.5 (0.96)
a) Electrodes	3.55	2.75	1.75	1.51	2.19	0.45
b) Steel wire, nail, nettings, etc.	20.25	16.75	19.75	6.39	4.18	3.05
4. Industrial fasteners	13.61 (1.29)	9.25 (0.92)	11.75 (1.01)	11.14 (1.02)	11.74 (1.0)	9.50 (0.70)
a) Bolts and nuts	--	--	--	7.41	9.12	7.00
b) Wood screws	--	--	--	0.88	1.81	1.00
c) Railway track materials	--	--	--	2.85	0.81	1.50
5. Wire ropes (high carbon wire products)	7.90 (0.78)	8.00 (0.80)	9.25 (0.80)	7.76 (0.71)	5.77 (0.50)	7.50 (0.55)
6. Sanitary castings	27.29 (2.20)	36.50 (3.65)	37.00 (3.2)	26.86 (2.45)	18.93 (1.57)	30.00 (2.21)

(Contd.)

Table 6.10 contd.

Sl.No. Commodities	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
7. Industrial castings	5.79 (0.57)	10.00 (1.0)	5.50 (0.48)	8.53 (0.78)	17.43 (1.45)	14.00 (1.03)
8. Forgings	0.38 (0.04)	4.00 (0.40)	3.75 (0.32)	5.49 (0.50)	9.67 (0.80)	12.75 (0.94)
9. Ferro alloys including charge chrome	5.64 (0.56)	11.75 (1.18)	26.00 (2.25)	1.54 (0.14)	0.13 (0.01)	0.50 (0.04)
10. Prime steel including pig iron, billets etc.	--	--	--	--	--	--
11. Steel products N.O.S.	37.68 (3.73)	41.00 (4.10)	45.00 (3.90)	35.84 (3.27)	35.52 (2.95)	39.25 (2.90)
a) Bright bars	0.56	1.00	0.75	0.60	0.39	5.00
b) Steel products	--	--	--	35.24	35.13	34.25
b1) S.S. Utensils	--	--	--	7.29	6.86	7.00
b2) Razor blades	--	--	--	3.22	6.03	6.00
b3) Steel furniture	--	--	--	2.71	2.48	2.00
b4) Other steel products	37.00	40.00	44.25	22.00	19.76	19.25
TOTAL	137.29	150.00	175.50	126.36	122.90	145.75

(Contd.)

Table 6.10 contd.

Sl.No. Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
B. PRIMARY STEEL AND PIG IRON BASED ITEMS						
1. Steel pipes & tubes	44.00 (2.77)	75.00 (3.19)	60.00 (1.71)	82.00 (1.63)	95.00 (1.40)	160.00 (1.82)
2. Ferrous halloware	2.00 (0.13)	3.00 (0.13)	11.00 (0.31)	43.00 (0.86)	60.00 (0.88)	65.00 (0.74)
3. Steel wire & wire products	15.50 (0.98)	32.00 (1.36)	46.50 (1.33)	60.00 (1.19)	90.00 (1.33)	130.00 (1.48)
a) Electrodes	0.50	5.00	6.50	6.00	10.00	15.00
b) Steel wire, nail, nettings, etc.	15.00	27.00	40.00	54.00	80.00	115.00
4. Industrial fasteners	19.00 (1.20)	26.00 (1.1)	35.00 (0.01)	51.00 (1.01)	83.00 (1.22)	102.00 (1.16)
a) Bolts and nuts	14.00	22.25	28.00	43.50	75.00	88.00
b) Wood screws	1.75					
c) Railway track materials	3.25	3.75	7.00	7.50	8.00	14.00
5. Wire ropes (high carbon wire products)	15.50 (0.98)	23.00 (0.98)	20.00 (0.57)	32.00 (0.64)	37.00 (0.55)	42.00 (0.48)
6. Sanitary castings	29.00 (1.83)	39.00 (1.66)	85.00 (2.43)	75.00 (1.49)	80.00 (1.18)	115.00 (1.31)

(Contd.)

Table 6.10 (contd.)

Sl.No. Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
7. Industrial castings	18.00 (1.13)	58.00 (2.47)	95.00 (2.71)	100.00 (1.99)	125.00 (1.84)	140.00 (1.59)
8. Forgings	24.00 (1.51)	38.75 (1.65)	45.00 (1.29)	65.00 (1.29)	110.00 (1.62)	85.00 (0.97)
9. Ferro alloys including charge chrome	19.25 (1.21)	8.25 (0.35)	75.25 (2.15)	177.00 (3.32)	225.00 (3.38)	230.00 (2.62)
10. Prime steel including pig iron, billets etc.	--	--	177.50 (5.67)	348.00 (6.93)	730.00 (10.77)	1720.00 (19.56)
11. Steel products N.O.S.	68.50 (4.31)	110.00 (4.68)	149.75 (4.28)	187.00 (3.78)	275.00 (4.00)	261.00 (2.97)
a) Bright bars	27.50	38.00	45.00	55.00	100.00	50.00
b) Steel products	41.00	72.00	104.75	132.00	175.00	211.00
b1) S.S. Utensils	8.00	12.50	30.00	20.00	60.00	75.00
b2) Razor blades	18.00	27.50	22.75	22.00	25.00	49.00
b3) Steel furniture	3.00	5.50	4.00	7.00	12.00	12.00
b4) Other steel products	12.00	26.50	48.00	81.00	78.00	75.00
TOTAL	254.75	413.00	800.00	1220.00	1910.00	3050.00

Note Figures in the parentheses are percentages.
Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta

in the year 1978-79. In the year 1993-94, the export of steel pipes and tubes was recorded at Rs.160 crore, while the percentage contribution declined to 5.2 per cent (See Table 6.10).

Iron and Steel Castings (All Sorts)

Casting is a process in which the metal is melted in furnace and poured into cavity (known as die). After solidifying it takes the shape of the cavity. This casting system is generally used where machining is not economical in giving a required shape to metal. India today exports the following cast iron products:

a. Manhole covers (M.T.)
b. Pans
c. Pipes and fittings
d. Scissors
e. Spun pipes and fittings
f. Valves
g. Weights, and
h. Ingots.

India mainly exports sanitary casting items. Out of the total export of Rs.33.97 crore of iron and steel casting in the year 1977-78, sanitary casting accounted for Rs.30.50 crore. In the year 1993-94 its contribution was Rs.115 crore.

If we see the geographical distribution of our export of iron and steel castings, three main regions, the Gulf, West Asia and the South East Asia account for nearly 80 per cent of our exports. "With the closure of forgings unit in Europe and other western nations on account of strict environment norms and exorbitant labour cost, automobile giants like General Motors and Ford are turning to India's forgings industry for sourcing axles, crankshafts and other fasteners" (Economic Times Data Bank, 1995).

Steel Products (NOS)

In the export list of primary steel and pig iron based items the steel products NOS occupy a prominent position. These steel products are useful for consumers as well as manufacturing process. India exports the following steel products:

a. Steel furniture
b. Builder's hardware and lodes
c. Stainless steel utensils and cutlery

d. Sanitary and water fittings

e. Agricultural implements, and

f. Razor blades.

In the above mentioned products, Builders' hardware rank first in the steel products. Qatar, Oman, Yemen Arab Republic etc. are the prominent importers of Indian builders' hardware. Sanitary and water fitting equipments are being exported not only to Gulf or West Asian countries but also to the highly developed countries such as Germany, Sweden, Canada, Australia and New Zealand.

It is a matter of pride for India that even a small item like the razor blade has proved its competitiveness in the developed markets like the USA, Brtain etc. In the year 1993-94 India exported razor blades worth Rs.49 crore, while at the time of independence India was an importer of razor blades.

Non-Ferrous Products

Non-ferrous product means any product which is made from any metal, except iron and steel. The products in which aluminium, copper, zinc, lead etc., are used are called non-ferrous metal products. India exports non-ferrous products also. In the year 1956-57, Indian exports of non-ferrous products amounted to Rs.1.10 crore which was 21.3 per cent of overall export of engineering goods. The year 1992-93 was a boom period for the export of non-ferrous products when the export value of non-ferrous products was as high as Rs.635 crore, representing 9.37 per cent of overall engineering exports. In comparison to 1956-57, the exports of non-ferrous products increased by more than twenty times (See Table 6.1).

Since 1976-77, all the non-ferrous products exporting countries have been facing the problem of demand slump. India was also suffering from the slump in non-ferrous product industry. The world consumption of non-ferrous products registered a fall of 2.36 per cent in 1980, over the preceding year. Keeping in tune with the trend in consumption, the world mines production of non-ferrous metals too started declining after 1980. The Indian exports of non-ferrous products declined from Rs.35.66 crore in 1976-77 to Rs.28.33 crore in 1978-79, due to this demand slump (See Table 6.11).

In the non-ferrous product group, India mainly exports aluminium products. Aluminium utensils, capsules,

Table 6.11: Itemwise Engineering Exports to India Non-Ferrous Products

(Rs. in crore)

Items	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
Aluminium products	3.04	9.27	24.4	12.53	12.84	9.56	10.00
E.P.N.S. ware	4.99	4.19	7.05	6.86	8.61	11.40	22.00
Non-ferrous products (other	3.56	2.07	4.17	5.42	6.88	9.18	--
TOTAL	11.59	15.53	35.66	24.81	28.33	30.14	32.00

Source: Engineering Export Promotion Council, <u>Handbook of Export Statistics</u> (1980-81), Calcutta.

aluminium sheets, circles and frills, aluminium ingots etc. are being exported by India. But India has totally stopped its export of aluminium furniture since 1975-76. Aluminium products alone fetch nearly 71 per cent of the foreign exchange, of the total export of all non-ferrous products (See Table 6.12).

The major buyers of aluminium utensils are South East Asian countries, West Asia and Africa. Saudi Arabia is the biggest importer of aluminium utensils, closely followed by Yemen Arab Republic. Both these countries consume nearly 40 per cent of India's export of aluminium utensils. Aluminium sheets are also being exported by India to the same three regions.

Other products of this group are being exported are EPNS ware and non-ferrous products, other than aluminium. EPNS ware is exported not only to African or West Asian countries, but also to highly developed countries such as Germany, Holland, Denmark, UK, Hungary etc. The UK is the biggest importer of EPNS ware, which alone consumes nearly 50 per cent of India's total exports.

"The year 1994 witnessed a boom phase in the case of non-ferrous metals in the global market. This was

Table 6.12: Itemwise Engineering Exports of India: Non-Ferrous Products

(Rs. in crore)

Sl.No.	Commodities	1982-83	1983-84	1984-85	1985-86		1986-87		1987-88	
C.	NON-FERROUS PRODUCTS									
1)	Pressure Cookers	--	--	--	0.23		0.46		1.25	
2)	Aluminium Utensils etc.	--	--	--	4.87	12.11 (1.11)	4.15	13.23 (1.1)	3.50	11.00
3)	Other Aluminium Products	13.82 (1.37)	9.25 (0.93)	11.00 (0.95)	7.01		8.62		6.25	
4)	EPNS wares	21.27 (2.10)	13.75 (1.38)	17.75 (1.54)	10.66		5.70		12.00	
						26.63 (2.43)				18.0 (1.33)
5)	Others	--	--		15.97		18.34		6.00	
	TOTAL	35.09	23.00	28.75	38.74		37.27		29.00	

(Contd.)

Table 6.12 Contd.

Sl.No.	Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
C.	NON-FERROUS PRODUCTS						
	Aluminium Products & Others	30.50 (1.92)	39.00 (1.66)	150.00 (4.29)	310.00 (6.17)	475.00 (7.01)	420.00 (4.78)
	EPNS Wares & Others	19.60 (1.2)	26.00 (1.11)	75.00 (2.14)	95.00 (1.89)	160.00 (2.36)	170.00 (1.93)
	TOTAL	49.50	65.00	225.00	405.00	635.00	590.00

Note Figures in the parentheses are percentages.
Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta

primarily due to the recovery in the US economy in 1994. The European economies and Japan are expected to experience higher growth rates in the coming years. This guarantees healthy prospects for the non-ferrous metal exports" (Economic Times Data Bank, 1995).

Consumer Durables

The wide ranging export list of the consumer durables shows the true diversification India has achieved in the export of engineering goods. Bicycles and spare parts, diesel engines, mechanical pumps, electric fans and parts, dry and storage batteries, sewing and knitting machines, surgical equipments etc. have established the credibility of Indian exports in the world market. The export of consumer durables are not confined to Gulf or West Asia or South East Asian countries, but we have acquired a world-wide market including the highly developed countries like USA, UK, Sweden, USSR, Germany etc.

Products covered under this group are primarily labour intensive and accounted for 37 per cent of the total engineering exports in 1979-80, with a monetary realisation of Rs.273.66 crore. In the year 1993-94, the export of consumer durables amounted to Rs.2,140 crore (See Table

6.1). By comparing aforesaid figures one can imagine the tremendous targets and grand progress achieved by this group. Some of the Indian producers of consumer durables are having a top reputation in the world market. For instance, in the field of bicycles and their parts, India is a leading exporter-cum-producer. In the field of hand tools a few manufacturing units in North India have attained the status of Asia's biggest producers.

The export of consumer durables offers bright opportunities. Today we have the necessary expertise and technical know-how. We have also developed a good industrial base. With comparatively low cost of labour, which is the pre-requisite for the production of consumer durables, and given necessary support by the government, which is equally important in international business, we are now able to touch the appreciable heights in the export of consumar durables. There are areas of production which the developed countries are discarding as they find them increasingly disadvantageous in terms of comparative costs. Japan, for instance, is importing calculators from South Korea and Taiwan. India can enter such fields (e.g. transistor radios, calculators, TV and the like) left by some of the advanced industrial countries (Trivedi, 1990).

Now let us discuss some of the major commodities in detail (See Table 6.13).

Auto Parts

In order to enter into the export market, an industry should have a firm base at home. It should be in a position to achieve a reasonable rate of growth every year, an ability to go on upgrading technology from within, so that product innovation and diversification are accomplished, in line with the technological change taking place in the user industry or the other areas of consumption. Fortunately, Indian auto parts industry can lay claim to all these.

Although India has been a late entrant in the world market of Auto-parts (India started exporting the Auto parts only after 1964-65), the export performance of Indian Auto-parts industry in the short span of 30 years has been quite encouraging, if not credible, considering the highest cost of production and several other constraints to which it, more often than not, is subjected to both at home and markets abroad. At the very beginning, in the year 1964-65, India exported Auto-parts worth Rs.0.47 crore. This figure rose to Rs.18.02 crore in 1975-

Table 6.13: Itemwise Engineering Exports of India: Consumer Durables

(Rs. in crore)

Sl.No. Commodities	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
D. CONSUMER DURABLES						
1. Auto Parts	53.09 (5.25)	30.75 (3.08)	42.00 (3.64)	49.19 (4.49)	46.93 (3.9)	45.00 (3.32)
2. Bicycles and parts	37.28 (3.69)	26.00 (2.60)	46.50 (4.03)	40.60 (3.71)	53.37 (4.43)	69.00 (5.10)
3. Hand, small and cutting tools	41.20 (4.07)	32.00 (3.20)	34.75 (3.01)	30.89 (2.82)	46.34 (3.85)	59.00 (4.35)
a) Hand tools	--	--	--	17.75	30.28	32.00
b) Small and cutting tools	--	--	--	8.24	9.56	18.50
c) Steel files	--	--	--	4.9	6.50	8.50
4. Internal combustion engine and air compressors	59.98 (5.93)	39.50 (3.95)	60.25 (5.2)	71.50 (6.53)	73.95 (6.14)	86.00 (6.35)
a) I.C. engine and parts	--	--	--	48.98	51.68	58.50
b) Inlet and exhaust valves	--	--	--	3.37	2.04	3.50
c) Air compressors	10.98	10.00	16.75	18.35	20.23	24.00

(Contd.)

Table 6.13 contd.

Sl.No. Commodities	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
5. Pumps	--	--	--	16.44 (1.50)	20.54 (1.73)	20.00 (1.48)
a) Mechanical pumps	11.45	12.75	18.25	13.06	15.77	9.00
b) Petrol dispensing pumps	--	--	--	1.79	2.99	6.50
c) Hand pumps	--	--	--	1.59	1.78	4.50
6. Electric fans and parts	12.17 (1.2)	7.00 (0.70)	7.25 (0.63)	6.85 (0.63)	5.47 (0.5)	5.75 (042)
7. Fabricated mica						
a) Products	23.17 (2.29)	28.00 (2.80)	25.00 (2.20)	15.14 (1.38)	16.53 (1.37)	12.50 (1.88)
b) Office machine	--	--	--	14.61	16.10	25.00
8. Batteries	39.41 (3.9)	26.00 (2.60)	35.00 (3.03)	50.99 (4.65)	43.1 (3.57)	56.00 (4.13)
a) Dry batteries	--	--	--	6.71	6.68	1.00
b) Storage batteries	--	--	--	44.28	36.73	55.00
9. Sewing machines and needles	3.44 (0.34)	3.00 (0.30)	2.75 (0.24)	7.20 (0.66)	14.09 (1.17)	18.75 (1.38)
a) Sewing machine and needles	--	--	--	5.33	12.09	16.00
b) Sewing needles (hand)	--	--	--	1.87	2.00	2.75

(Contd.)

Table 6.13 contd.

Sl.No. Commodities	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
10. Electric manufacture N.O.S.	15.88 (1.57)	7.00 (0.70)	9.75 (0.84)	21.79 (1.99)	13.25 (1.16)	11.00 (0.81)
11. Scientific instruments (surgical) etc.	13.90 (1.37)	6.00 (0.60)	6.50 (0.56)	12.87 (1.17)	26.96 (2.23)	12.00 (0.89)
12. Miscellaneous manufactured articles	25.32 (2.50)	37.00 (3.70)	40.25 (3.48)	10.82 (0.99)	5.95 (0.50)	13.75 (1.01)
TOTAL	386.96	382.00	462.00	349.09	382.49	433.75
E. MANAGEMENT AND TECHNICAL SERVICES	75.00	72.00	85.00	65.00	52.00	50.00
F. ELECTRONICS AND SOFTWARE	--		--	90.52	115.00	190.00
i) Electronics	13.60	18.00	25.00	25.00	45.00	60.00
Total of F	13.60	18.00	25.00	115.52	160.00	250.00

(Contd.)

Table 6.13 contd.

Sl.No. Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
D. CONSUMER DURABLES						
1. Auto Parts	95.00 (5.98)	135.00 (5.74)	160.00 (4.57)	265.00 (5.27)	365.00 (5.38)	435.00 (4.95)
2. Bicycles and parts	89.00 (5.6)	125.00 (5.32)	140.00 (4.0)	300.00 (5.97)	445.00 (6.56)	555.00 (6.31)
3. Hand, small and cutting tools	66.75 (4.20)	104.00 (4.43)	124.00 (3.54)	159.00 (3.16)	250.00 (3.69)	272.00 (3.09)
a) Hand tools	34.00	65.00	77.00	96.00	165.00	180.00
b) Small and cutting tools	22.00	24.50	47.00	63.00	85.00	92.00
c) Steel files	10.75	14.50	--	--	--	--
4. Internal combustion engine and air compressors	131.50 (8.28)	191.50 (8.15)	196.00 (5.60)	253.00 (5.03)	310.00 (4.57)	395.00 (4.49)
a) I.C. engine and parts	91.00	138.00	156.00	206.00	260.00	340.00
b) Inlet and exhaust valves	--	--	--	--	--	--
c) Air compressors	40.50	53.50	40.00	47.00	50.00	55.00

(Contd.)

Table 6.13 contd.

Sl.No.	Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
5.	Pumps	--	--	--	--	--	---
	a) Mechanical pumps	12.50	35.50	38.00	55.00	75.00	90.00
	b) Petrol dispensing pumps	--	--	--	--		--
	c) Hand pumps	--	--	--	--	--	---
6.	Electric fans and parts	6.50 (0.41)	8.50 (0.36)	12.00 (0.34)	19.00 (0.31)	30.00 (0.44)	27.00 (0.31)
7.	Fabricated mica						
	a) Products	15.50 (0.98)	45.00 (1.91)	55.00 (1.57)	53.00 (1.05)	35.00 (0.52)	40.00 (0.45)
	b) Office machine	45.50	31.00	30.00	45.00	18.00	13.00
8.	Batteries	77.50 (4.56)	87.00 (3.70)	94.00 (2.69)	84.00 (1.67)	15.00 (0.22)	35.00 (6.40)
	a) Dry batteries	0.25	0.25	1.00	12.00	0.25	1.00
	b) Storage batteries	72.25	86.75	93.00	72.00	14.75	34.00
9.	Sewing machines and needles	13.25 (0.87)	20.00 (0.85)	15.00 (0.43)	19.00 (0.38)	27.00 (0.40)	28.00 (0.32)
	a) Sewing machine and needles	--	--	--	----	--	--
	b) Sewing needles (hand)	--	--	--	--		--

(Contd.)

Table 6.13 contd.

Sl.No. Commodities	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
10. Electric manufacture N.O.S.	14.00 (0.88)	21.00 (0.89)	48.00 (1.37)	35.00 (0.70)	60.00 (0.88)	105.00 (1.19)
11. Scientific instruments (surgical) etc.	14.00 (0.88)	20.00 (0.85)	65.00 (1.86)	70.00 (1.39)	58.00 (0.86)	75.00 (0.85)
12. Miscellaneous manufactured articles	25.00 (1.57)	17.00 (0.72)	54.00 (1.54)	53.00 (1.05)	67.00 (0.99)	70.00 (0.80)
TOTAL	601.00	830.00	1025.00	1410.00	1755.00	2140.00
E. MANAGEMENT AND TECHNICAL SERVICES	90.00	135.00	200.00	275.00	445.00	585.00
F. ELECTRONICS AND SOFTWARE	--	--	--	--	--	--
i) Electronics	--	--	--	--	--	--
TOTAL OF F	--	--	--	--	--	

Note Figures in the parentheses are percentages.
Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta

76. In the year 1993-94, India exported Auto parts worth of Rs.435 crore (See Table 6.13).

Growing confidence, in the improving quality and sophistication of the Indian Auto parts, of certain highly developed markets in West Europe is illustrated also by the fact that a country like West Germany imports Auto-parts from India for the original use. Further, of late, Australia and Asian countries have been increasingly turning to India for their Auto-parts requirements. India exports auto-parts namely, trailors, pistons, piston pins, piston rings, gaskets, engine valves, carburettors, radiators, spark plugs, starter motor, ignition coils, fly-wheel magnates, clutch assembly and plates, gears, tyre, tube valves, auto-lamps etc.

The world trade in auto-parts is massive in money terms, and is growing bigger everyday. A remarkable development in modern car making is the international exchange of technology and products. Automobile manufacture is now deemed far too complex and competitive an undertaking for a country, even like the USA or Japan, to go at it alone. The emphasis now has clearly shifted from national self-sufficiency and self-reliance to obtaining components - nearly a thousand in a car - from the best source anywhere (Mohinder Singh, 1995).

The following diagram gives an idea of this interdependence.

Automobile manufacturers are always on the look-out for securing the specified components and parts that are defect-free, timely in supply, and comparatively priced. The foremost consideration is quality, as no major manufacturer will risk the reputation of its make by buying components of suspect quality, particularly those integral to the vehicles propulsion system and safety.

The last 25 years saw steady improvements in automobile fuel efficiency, safety and pollution control. But the next 25 years are likely to witness a re-invention of automobiles. Light, but strong bodies made of synthetic composites instead of steel, advanced aerodynamics with the bottom as smooth as the roof, and probably hybrid fuel-electric cars. Our best bet, it seems, is to concentrate on export of auto components and parts. This area of intermediate technology holds for us much promise of success, and it is almost a limitless area of engineering exports.

Bicycle and Parts

Bicycle and bicycle parts are important non-traditional engineering items of export. India started exporting bicycle and parts in the year 1956-57 with an export value of Rs.0.05 crore. There was a sudden boost in the export of bicycles and their parts in the year 1965-66, when India exported this item worth Rs.555 crore, which was 25.93 per cent to the total export of consumer durables.

In the bicycles and bicycle parts, the latter constitute the major export share. Generally the export ratio lies 1:3 in favour of bicycle parts. The D.V.Kapoor Committee Report on Perspective Plan and Strategy for Export of Engineering and Capital Goods has very thoughtfully given an expression to this idea and identified a number of products for necessary thrust of India's exports. It is understood that such packages have been finalised for a few items, such as bicycles (Paul, 1992).

So far as the geographical distribution of the bicycle export is concerned, India has made inroads even to Africa which is considered to be a promising market from the Indian point of view. Tanzania, Uganda, Ghana, and

Nigeria contributed nearly 60 per cent of the total Indian exports of complete cycles. Nigeria is the biggest importer of Indian bicycles and parts. Russia, France, Denmark, Holland, Singapore and Bangaladesh also are prominent importers of Indian bicycles and bicycle parts.

But the above mentioned countries have a number of complaints against Indian bicycles. The Indian exporters must look into these complaints and try to redress them if they want to stand in competition with the UK and Japan. The importers in Tanzania and Uganda complain that the frames and tubes of the Indian bicycles degrade even within the guarantee period of one year. The importers in Thailand report that they are fully convinced of the standard quality of the Indian cycles but the consumers prefered the Japanese cycles due to their better finish and polish.

There are a number of countries, such as Russia, Korea and Japan who are pricing out India. The Indian exporters face one major problem due to the location of manufacturing units mainly in North India. Exporters have to spend considerable amount in transporting the goods to ports. It is difficult for them to face the stiff international price competition because of the financial burden.

Diesel Engines - Internal Combustion Engines and Air Compressors

Diesel Engine is a prime mover which converts heat energy (obtained by burning diesel oil) into mechanical energy. Diesel engines are important non-traditional engineering items of export.

Diesel engines are widely used primarily for three purposes (a) irrigation (b) generation of electricity and (c) transportation for industrial and domestic purposes. India has attained a stage of maturity in the export of diesel engines. From a sluggish export figure of Rs.0.07 crore in the year 1956-57, India exported diesel engines worth Rs.3.95 crore in 1993-94 (See Table 6.13). Now diesel engines constitute a major portion in India's export of consumer durables. In the year 1993-94, the share of diesel engines to the total export of consumer durables was 18.45 per cent.

So for as geographical distribution of diesel engines and their parts is concerned, one thing is to be noted that the major chunk of diesel engines complete is being exported to the middle East region. Saudi Arabia, Iran and Iraq account for nearly 40 per cent of our exports and for the remaining 60 per cent, there are two prominent regions - first the West Asia and the second South East Asia. Quatar, Oman, Lebanon, and Jordan in the West Asia and Sri Lanka, Bangladesh, Burma, Singapore and Indonesia are the prominent countries of the South East Asia. Sri Lanka is the biggest importer of the Indian diesel engines in the South East Asia.

Electric Fans

India has made an all out effort to augment the export of electric fans. In the year 1956-57, India exported electric-fans and parts worth Rs.0.21 crore, this figure rose upto Rs.11.14 crore in the year 1976-77. In the year 1992-93, the export of electric fans recorded an all time high of Rs.30 crore (See Table 6.13).

India exports mainly two items in electric fans. The first is the ceiling fans and the second one is the electric fan parts. The table fans of India are not popular abroad because of their uncompetitive quality and price. India is fairly competitive for the ceiling fans.

Electric fan parts are not very much popular. Hence, India generally exports 5 to 10 per cent of the total export of fans and their parts.

If the geographical distribution of electric fans and their parts are analysed, it will be clear that the Gulf countries import nearly 75 per cent of the total Indian exports of fans and parts. The prominent countries of the region are Jordan, Oman, Qatar and Saudi Arabia. The Second prominent region is Africa, Ethiopia, Kenya, Tanzania, Zambia, Sudan and Nigeria are the countries where India exported a considerable volume of electric fans and parts during the 70's and 80's. In the South-East Asian region also India has been gaining good ground. Bangladesh, Indonesia, Malaysia, Nepal and Singapore are the importer countries of Indian electric fans. In the South East Asia, Malaysia is the biggest importer of fans. The main competitor of India in the export of electric fans is Japan. But the price of Indian fans is lower in comparison with that of Japan and other competitors. This is highly advantageous to India and India cannot be priced out by Japan as happens in other products.

Hand, Small and Cutting Tools

India exports hand, small and cutting tools of a high quality. These tools are made of high speed steel and are capable of cutting steel and non-ferrous metals at a very high speed.

India exports the following head, small and cutting tools-

a) Hacksaw and Band Saw blades
b) Pipe wrenches
c) Pliers
d) Spanners
e) Vices
f) Diamond tools and Bit tools
g) Threading tools (including tapes and dies)
h) Tungsten carbide tips and powder
i) Twist drills and
j) Steel files

These tools fetch 12 to 16 per cent of the total export of consumer durables. In the year 1956-57, India exported hand, small and cutting tools worth Rs.0.16 crore. In the year 1978-79, this percentage share rose to 18 per cent. In the year 1993-94 this percentage share went down to 12 per cent. In the year 1978-79, this figure rose upto Rs.43.20 crore. In the year 1993-94, the exports unexpectedly picked upto Rs.272 crore (See Table 6.13).

Pipe wrenches and spanners are the promising items in the export of hand,small and cutting tools. These two items contribute 40 per cent of the total export of hand, small and cutting tools.

So far as the geographical distribution of export is concerned these tools have got the worldwide market. Countries like the USA, UK, Germany, Denmark, Belgium, Canada, Switzerland and Australia are the prominent importers of these items. In the African region, Tanzania, Zambia and Ethiopia also import the Indian tools. The US is the biggest importer of Indian hand and cutting tools.

Batteries - Dry and Storage

India exports dry and storage batteries in a large quantity. Dry batteries are nothing but the primary cells of 1.5 volts which are generally used in torch, transistors, fresh lights, etc. Storage batteries are the secondary cells which can be used again and again, because in this type of battery electrical energy can be converted into chemical energy or vice-versa. So far as the dry batteries are concerned, India exports it to a number of countries of which the biggest importer is Germany and the others are the Gulf countries, the European and African countries.

In the year 1977-78, India exported storage batteries worth Rs.10.90 crore and this increased to Rs.94 crore in 1990-91. In the year 1993-94 exports declined to Rs.34 crore. What is surprising is that the erstwhile USSR alone imported 90 per cent of the total export of storage batteries from India. The remaining 10 per cent went to the South East Asian, Gulf and African regions.

Pumps

The mechanical pumps and heating and cooling equipments also have an important place in the export of the consumer durables. In the year 1977-78, India exported mechanical pumps worth Rs.7.34 crore and in the year 1993-94 contribution of this item went upto Rs.90 crore.

Miscellaneous Articles

In addition to the above mentioned items, India exports other miscellaneous items also. These are as follows:

a) Scientific and surgical instruments

b) Oil lamps and stoves

c) Fire arms and sports goods

d) Abrasive and grinding wheels

e) Ball and Roller bearing and

f) Umbrella and fittings.

The scientific and surgical equipments of India are very popular in the Afro-European countries. South East Asia and Africa are the prominent markets for the Indian surgical and scientific equipments. For the remaining items, there is no sound and specific market since the export volume of the remaining items is very low.

MANAGEMENT AND TECHNICAL SERVICES

Project and consultancy services comprise such areas as turnkey jobs, civil engineering, industrial installations, business management and technical services. According to the import policy of the government of India, the following types of contracts are treated as project exports.

i) Turnkey projects, which involve rendering of services like design, civil construction, erection and commissioning of plant or part thereof, its supervision along with supply of equipment.

ii) Engineering services contracts, involving supply of services alone such as design, erection, commissioning or supervision of erection and commissioning.

iii) Consultancy services contracts which may include the preparation of feasibility studies, project reports, preparation of designs and advice to the project authority on specifications for plant and equipment, preparation of tender documents, evaluation of tenders and purchase of plant and equipment; and

iv) Civil construction contracts, with or without preparation of design or drawings for civil works to be undertaken.

Over the years, India has developed adequate infrastructure and expertise for planning and executing a wide variety of projects which is evident by the vastly transformed export structure and successful completion of a number of projects both within and outside the country. This radical change in the engineering capability has been facilitated mainly by the strong emphasis laid on technical education in India's successive five year plans.

As things stand today, India can legitimately claim to posses the world's third largest technical manpower after United States and the erstwhile Soviet Union. This huge reservoir of technically qualified and experienced personnel enables India to provide the whole gamut of project execution and consultancy services covering development planning, environment planning, social engineering, project identification and implementation, marketing research and techno-economic studies, public utility, evaluation of plant and equipment and several other inter-disciplinary areas.

Export of Indian project and consultancy services made its modest beginning in the mid-seventies. This development could be attributed to three factors (1) the financial boom in the OPEC countries due to high oil prices (2) Growth in multilateral funding projects by the World Bank and (3) aspirations of developing countries for industrialisation.

According to EXIM Bank sources, India has successfully executed 1114 overseas bids valued at Rs.9886 crore between July 1975 and 1989-90. Year-wise data on project bids and their success rate are given in Table 6.14.

Nearly 100 units belonging to both public and private sectors are involved in these projects and they have also acted as prime contractors. Despite certain lapses on the part of our exporters in meeting their contractual obligations, India has carved a niche for itself in this growth area, particularly in the Middle-East. Btween 1975-76 and 1980-81, Indian project exports recorded a quantum jump, rising from Rs.232 crore to Rs.1613 crore. During this period, the number of bids also spurted from 40 to 60. Considering that only a few Indian contractors have ventured into overseas markets, the volume of business is considered sizeable. Additionally, this experience has exposed them to a highly competitive global environment and technology.

In the eighties, especially after 1982, the bids as well as their values witnessed a declining trend reaching a low of 138 bid valued at Rs.1521 crore. The

Table 6.14: Details of Project Exports from India between 1975-76 and 1989-90

(Rs. in crore)

Year	Total Bids		Successful Bids		Success Rate	
	No.	Val.	No.	Val.	No.	Val.
1975-76	76	574	40	232	53	40
1976-77	187	3458	91	956	49	28
1977-78	313	3457	106	611	34	18
1978-79	381	5726	123	866	32	15
1979-80	410	6217	124	846	30	14
1980-81	306	7251	106	1613	35	22
1981-82	283	6036	92	1195	33	20
1982	308	8501	96	692	31	8
1983	246	4288	47	271	19	6
1984	173	3160	47	354	27	11
1985	165	3210	50	437	33	20
1986	138	1521	45	394	49	40
1987	140	3354	55	409	42	17
1988-89	163	4976	64	497	55	15
1989-90	157	3700	28	430	18	12

Note: Success rate is based on successful bids as a percentage of bids whole results are known.

Source: Export Import Bank of India, Bombay.

situation in respect of successful bids and the rate of success was no better. Not only this, there was reduction in the number of countries where India submitted its offers. This has been possible due to a policy of selectivity on the part of Indian exporters for their operations in target markets.

The position, however, started improving in 1987 when the number of bids rose to 140 and their value shot up to Rs.3354 crore. This uptrend continued in 1989-90 with the number of bids rising to 163 and their value touching Rs.4976 crore. Some improvement in the success rate of projects financed by multilateral funded agencies like the World Bank, Asian Development Bank and African Development Bank was also witnessed in 1988-89.

Accounting for nearly three-fourths of the successful bids, construction and turnkey projects have lions share in project and consultancy exports from India. This position has, however, changed over the years, as shown in Table 6.15.

Project exports can be broadly classified into three categories: civil engineering construction projects,

Table 6.15: Area-wise Successful Project Bids, 1985 to 1989-90.

(Rs. in crore)

	1985	1987	1988-89	1989-90
Construction	37.7 (69.05)	144 (35.20)	177 (35.61)	88 (20.57)
Consultancy	47 (8.42)	66 (16.14)	53 (10.67)	40 (9.30)
Turnkey	106 (19.42)	149 (36.43)	189 (38.03)	250 (58.14)
Others	17 (3.12)	50 (12.23)	78 (15.69)	52 (12.09)
Total	546	409	497	430

Note: Figures in brackets show percentage to total.

Source: Export Import Bank of India, Bombay.

industrial turnkey projects and the associated sub-contracting services. The total values of the contracts secured in respect of the export of projects are given in Table 6.16 for each year from 1988-89 to 1992-93. Nevertheless, the successful execution and maintenance of the projects overseas have proved the Indian capabilities in the export of technology in terms of their merit.

Consultancy Export plays a major role in technology transfer and in promoting the export of equipment and materials. In view of the multiplier effect of the consultancy services, this sector has been identified as one among the thrust sectors for export promotion by the Government of India. In recent years, the Indian consultants have played an important role by offering services in several diversified fields. Today, there are about 20,000 highly specialised professionals and technocrats working in more than 700 consultancy organisations or are independently offering services in a wide range of disciplines. Table 6.17 gives the consultancy earnings year-wise from 1978-79 to 1992-93.

It may be observed from Table 6.17 that there has been an increasing trend in this type of export and that

Table 6.16: Earnings in Project Exports from 1988-89 to 1993-94

Year	(Rs. in crore)
1988-89	495
1989-90	560
1990-91	1115
1991-92	1417
1992-93	1543
1993-94	792

Source: Yojana (1994), 15 August, p.22.

Table 6.17: Consultancy Export Earnings from 1978-79 to 1992-93

Year	Rs. in million
1978-79	95.61
1979-80	226.55
1980-81	226.56
1981-82	312.50
1982-83	475.76
1983-84	585.01
1984-85	578.30
1985-86	734.07
1986-87	939.04
1987-88	1003.40
1988-89	1260.00
1989-90	2200.00
1990-91	3120.00
1991-92	7200.00
1992-93	8310.00

Source: Yojana (1994), 15 August, p.23.

this increase is significantly larger from 1989-90 onwards as compared to the earlier years. In fact in 1991-92, the exports were more than double than that of the period 1990-91.

In the context of the new industrial policy announced in July, 1991, the preparedness to face the international, competitive technological capabilities, for providing appropriate technical inputs to the enterprises, has emerged as a new task before the Indian entrepreneurs. Naturally, then the choice and acquisition of new technologies to produce competitive products and services to suit the international environment become the important issues in the context of industrial development of the country. Since expansion of exports is the key word in the new environment, the service sector is expected to play an increasingly dominant role in the industrial and economic development in the future.

The consultants and consultancy services would therefore, assume greater significance in the process of technological, industrial and economic development.

Another area in which technology exports take place is the joint ventures. A joint venture is an enterprise in the manufacturing, trading or service sectors in which the entrepreneurs in the host country, where the joint venture is located, collaborate with the entrepreneurs from oen or more foreign countries in the manufacturing and or management and/or financial operations of the joint venture.

According to the latest data available as on 31st December, 1992 from the Indian Investment Centre, there were about 324 joint ventures in operation or under implementation in the areas of automative ancillaries, transport equipments, food processing industry, paper and pulp industry, textile, sugar factory, steel furniture, metal flexible tubes, railway network, newsprint projects, palm oil refining, machine tool complex, industrial estates and light engineering goods such as switch gears, stainless steel ware etc.

Indian project exports cover over 50 countries, mainly in the Middle East, South and South East Asia and Africa. During the boom period, these three regions accounted for almost 95 per cent of total Indian project exports. With a market share of 44 per cent, the middle east dominated the scene, followed by South and South East Asia (30 per cent) and Africa (22 per cent).

"New Avenues are opening up in the areas of joint ventures, turnkey projects, joint production programmes sub-contracting, marketing in third world countries and consultancy. Many challenging opportunities await us in these areas and these have become particularly marked in the Gulf countries, the Afro-Asian markets and Caribbean" (Agarwala, 1978).

Indian project exporters to middle east concentrated mainly on infrastructure - related power projects and the main target markets were Iran, Iraq and Saudi Arabia. In the South and South-East Asia, we concentrated rather on projects in the areas of textiles, cement, sugar, paper and pulp, steel, machine tools and simple metal manufactures. Our principal markets in these regions were Indonesia, Nepal and Bangladesh.

A COMMODITY SECTOR-WISE ANALYSIS

A sector-wise analysis since - selected years - 1956-57 brings out the shift in the structure of India's exports. Capital goods showed a steadily increasing trend from 12.1 per cent of total engineering exports in 1955-56 to 40 per cent in 1971-72. It fell to 35.70 per cent at the end of 1990-91 and afterwards went upto 27.62 per cent

Table 6.18: Percentage Share of Different Commodity Groups in Total Engineering Exports: Selected Years

Commodity Groups	1955-56	1960-61	1971-72	1980-81	1990-91	1993-94
1. Capital goods	12.1	10.82	40.30	34.80	35.70	27.62
2. Primarily steel and pig iron based items	32.90	30.68	19.10	17.00	22.86	34.68
3. Non-ferrous products	21.30	10.35	3.60	6.20	6.43	6.70
4. Consumer durables	33.70	36.73	37.00	41.90	29.29	24.33
5. Management and technical services	--	--	--	--	5.71	6.65

Source: Compiled from Engineering Export Promotion Council Data Sheets, various issues, Calcutta in 1993-94. Similar trend is also seen in the case of consumer durables. From 33.70 per cent in 1955-56, its share increased to 41.9 per cent in 1980-81. During 1990-91, however, it showed a decreasing trend and went down to 29.29 per cent and still further down to 24.3 per cent in 1993-94 (See Table 6.18).

On the other hand the item registering the sharpest decline in relative share was non-ferrous products from 21.3 per cent in 1955-56 to 3.6 per cent in 1971-72. Of late non-ferrous products exports percentage values were rising reversing the earlier trend.

The steel based items comprised of 32.9 per cent of the total export of engineering items in 1955-56, but their share fell to 17 per cent in 1980-81. Of late their exports are rising and their share increased to 34.68 per cent in 1993-94.

GROWTH RATE OF VOLUME OF COMMODITY GROUPS IN TOTAL ENGINEERING EXPORTS: 1971-72 TO 1993-94

To examine the growth in the engineering product exports and the relative importance of different commodity groups, an attempt is made to compute growth rates for six commodity groups. These growth rates are calculated for the 24 year period from 1970-71 to 1993-94 and also for some sub-periods. The estimated growth rates are given in Tables 6.19, 6.20 and 6.21.

It is clear from these tables that throughout the period under study and during the sub-periods, non-ferrous products registered higher growth rates than capital goods, primarily steel and pig iron based items and consumer durables. But the R^2 value is less than other values in all these years.

During the whole period under consideration, capital goods and primarily steel and pig iron based items have grown at 15.30 per cent and 15.27 per cent respectively. On the other hand, consumer durables and management and technical services showed growth rates of 15.28 per cent and 17.59 per cent respectively. It is also evident from these tables that the R^2 value of capital goods and consumer durables is higher than other commodity groups. Though management and consultancy services show a higher growth rate, its R^2 value is very less in comparison.

Table 6.19: Growth Rate of Value of Commodity Groups in Total Engineering Exports: 1971-72 to 1981-82.

Commodity Group	b	R^2
1. Capital goods	21.1346 (13.15459)	0.9506
2. Non-ferrous products	22.9765 (7.43138)	0.8599
3. Primarily steel and pig iron based items	19.9188 (5.80608)	0.7893
4. Consumer durables	22.0593 (13.51237)	0.9530

b = Exponential growth rate.
Figures in brackets represent 't' values.
Growth rate (b) is estimated for annual data by using an equation of the form Lny = A+Bt+e at current prices.

Table 6.20: Growth Rate of Value of Commodity Groups in Total Engineering Exports: 1982-83 to 1993-94

Commodity Group	b	R^2
1. Capital goods	19.3570 (10.01446)	0.9003
2. Non-ferrous products	31.6166 (6.51677)	0.8094
3. Primarily steel and pig iron based items	29.3763 (6.94579)	0.8283
4. Consumer durables	16.9169 (7.91610)	0.8624

b = Exponential growth rate.
Figures in brackets represent 't' values.
Growth rate (b) is estimated for annual data by using an equation of the form Lny = A+Bt+e at current prices.

Table 6.21: Growth Rate of Value of Commodity Groups in Total Engineering Exports: 1971-72 to 1993-94

Commodity Group	b	R^2
1. Capital goods	15.3024 (17.66019)	0.9369
2. Non-ferrous products	17.0162 (8.38937)	0.7702
3. Primarily steel and pig iron based items	15.2748 (8.05332)	0.7554
4. Consumer durables	14.2808 (15.17542)	0.9164
5. Electronics & software	64.6783* (7.82918)	0.9387
6. Management & consultancy services	17.5956** (5.02697)	0.6967

b = Exponential growth rate.
Figures in brackets represent 't' values.
*Degrees of freedom 4.
** Degrees of freedom 11.
Growth rate (b) is estimated for annual data by using an equation of the form Lny = A+Bt+e at current prices.

GROWTH RATES OF PRINCIPAL EXPORTS

Of the 33 principal export items considered, all the commodities, except one, exhibit positive and significant growth rates. One commodity, namely, wagons and coaches did not exhibit such a growth rate.

On the 32 commodities which showed positive growth rates, the export of 17 commodities, namely fabricated steel structures, complete vehicles, steel pipes and tubes, ferrous halloware, industrial fasteners, industrial castings, forgings, ferro alloys including charge chrome steel products, NOS, aluminium utensils and others, EPNS wares and others, auto parts, bicycles and parts, hand, small and cutting tools, industrial combustion engine and air compressors, sewing machines and needles and scientific instruments increased at a faster rate than the total engineering exports of the country during this period.

The highest growth rate has been exhibited by industrial castings, aluminium utensils, EPNS wares and others and auto parts. As a result of this, faster growth in the exports of these commodities, in relation to the total engineering exports of the country, is found which is both positive and significant as shown in Table 6.22.

Table 6.22: Growth Rate of Value of Principal Exports Group of Engineering Exports: 1982-83 to 1993-94

Commodity Group	B	R^2
Industrial plant and machinery	18.5178 (11.02645)*	0.9240
Electric power machinery and switchgear	18.4972 (5.65130)*	0.7615
Fabricated steel structures	25.8305 (7.87896)*	0.8613
Transmission line towers	16.9621 (1.79913)*	0.2445
Wire and cables	6.7815 (2.53075)**	0.3904
Wagons and coaches	-2.1180 (-0.38396)*	0.0145
Coastal vessels and ships	17.8770 (1.16116)*	0.1188
Complete vehicles	26.5730 (6.68753)*	0.8173
Machine tools	13.6838 (7.27285)*	0.8416
Steel pipes or tubes	21.8720 (6.93532)*	0.8279

(Contd.)

Table 6.22 Contd.

Commodity Group	b	R^2
Ferrous halloware	23.3355 (2.42220)**	0.3698
Steel wire and wire products	19.1673 (2.62061)**	0.4071
Industrial fasteners	21.4958 (6.72055)*	0.8187
Wire ropes	17.6427 (6.36099)*	0.8018
Sanitary castings	12.4915 (4.08017)*	0.6247
Industrial castings	32.8618 (10.16617)*	0.9118
Forgings	21.7341 (5.40873)*	0.7453
Ferro alloys including charge chrome	23.8154 (8.12585)*	0.8685
Steel products NOS	20.7996 (7.41331)*	0.8461
Aluminium utensils and others	39.5876 (7.06168)*	0.8330
EPNS wares and others	43.5749 (10.01520)*	0.9093

Table 6.22 Contd.

Commodity Group	b	R^2
Auto parts	34.2354 (3.95987)*	0.6106
Bicycles and parts	27.0325 (11.33458)*	0.9278
Hand, small and cutting tools	20.7711 (9.90645)*	0.9075
Industrial combustion engine and air compressors	20.1544 (13.10349)*	0.9450
Electric fans and parts	11.4879 (3.04284)*	0.4808
Fabricated mica products	7.7797 (2.43328)**	0.3719
Batteries	1.8540 (0.38947)*	0.0149
Sewing machines and needles	21.2386 (6.55278)*	0.8111
Electric manufactures, NOS	19.1020 (5.01246)*	0.7153
Scientific instruments (surgical) etc.	22.0113 (5.46012)*	0.7488
Miscellaneous manufactured articles	10.5739 (1.76590)*	0.2377

Table 6.22 Contd.

Commodity	b	R^2
Management and technical services	19.6771* (5.05862)	0.7190

Note: Figures in brackets represent 't' values.

* significant at 10 per cent level.
** significant at 5 per cent level.

A disturbing feature of the export performance is that of the four items, namely, wires and cables, wagons and coaches, fabricated mica and mica products and batteries, recorded less than 10 per cent growth rate. This is due to the fact that many developing countries of Asia and Africa have launched a programme of industrialisation through import substitution during the late seventies and eighties. As a result of this, these countries started producing less sophisticated engineering goods on their own.

CHAPTER VII

REGION-WISE ANALYSIS

Majority of the nations are now marching towards globalisation in trade. A uniform pattern of export and import policy has been accepted after the General Agreement on Tariff and Trade in 1994. India is trying to emerge as an economic giant in the global market with the help of multi-trade and bilateral-trade agreements. Since our policy is for globalisation, to concentrate on future exports on an overall regional basis, the rate of exports should be reviewed to understand the changing trends.

Along with diversification and product range, directional pattern of our exports has also been diversified to a considerable extent over the period 1956-57 to 1993-94.

Regionwise Analysis

For the purpose of regionwise analysis, the countries are grouped under the following seven economic regions for calculating the percentage shares and growth rates of these regions in India's exports of engineering goods.

1. Asia - a) South East Asia
   b) West Asia
2. Africa - a) East Africa
   b) Sub-Sahara Africa
      i) North Africa
      ii) West and Central Africa
3. Europe - a) East Europe
   b) West Europe
4. America
5. Australia
6. Oceanic Islands, and
7. Others.

Major Geographic Shift in Engineering Exports

1. Sixties

During 1960s, India registered a positive growth in each sector. Major markets during this decade were South East Asia, West Asia, and Africa. They have 34.45 per cent, 24.53 per cent and 19.69 per cent shares respectively (See Table 7.1). Nearly 96 per cent of engineering goods exports was directed to Asia and Africa in 1956-57. East Europe, though showed the largest annual average growth rate of 195.75 per cent during 60s, did not emerge as a very large market in 60s. The annual average

Table 7.1: Shifting Pattern of India's Engineering Exports

(Average share percentage)

Region	1960s		1970s		1980s
	AAGR	ASP	AAGR	ASP	ASP
South East Asia	15.07	34.45	37.72	25.73	16.23
West Asia	32.40	24.53	41.93	26.12	16.03
Africa	38.71	19.69	20.66	19.76	14.81
East Europe	195.75	5.04	16.47	9.19	19.38
West Europe	54.35	7.20	30.6	10.37	9.83
North America	37.46	4.24	44.52	6.09	9.13
Others	--	4.85	--	2.74	9.18

AAGR: Annual Average Growth Rate; ASP: Average Share Percentage.

Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta

contribution of West Europe, East Europe and North America in India's engineering exports during 60s were 7.2 per cent, 5.04 per cent and 4.24 per cent respectively. During the same decade, contribution of Australia in India's engineering exports were not significant enough.

2. Seventies

In 1970s, West Asia emerged as the largest region for India's engineering exports with a share of 26.12 per cent (Table 7.1) as against South East Asia during 60s.

South East Asia's annual average share dropped to 25.73 per cent in 70s from 34.45 per cent in 60s. This can partially be attributed to furthering the export effort in other regions viz., East Europe, West Europe and North America. As a result, contribution of West Europe, East Europe and North America has went up significantly to 10.37 per cent, 9.19 per cent and 6.09 per cent respectively during 70s.

During 70s North America registered the highest annual average growth rate of 44.52 per cent followed by West Asia (41.93 per cent) and South East Asia (37.72 per cent). Seventies, like 60s, witnessed Central America, South America and Australia as not so important regions as far as India's engineering export was concerned.

The fact which made a major contribution during 1960s and 1970s in pushing up India's exports to the Asian countries was the capability of the Indian industrialists to set up a large number of joint ventures in the countries of the region. Among these, the important countries were Malaysia, Indonesia, Singapore, Thailand, Sri Lanka, Iran and Iraq. Since machinery for most of these projects set up by the Indian industrialists was exported from India, engineering exports were encouraged.

3. Eighties

During 1980s, East Europe has emerged as the largest market for India's engineering exports with an annual average share of 19.38 per cent. The other three important regions where India's annual average share during 80s have gone down are South East Asia, West Asia and Africa and their annual average share of 80s were 16.23 per cent, 16.03 per cent and 14.81 per cent respectively.

North America has increased its share to 9.13 per cent during this decade from an annual average share of

6.09 per cent during 70s. The share of West Europe during this decade has increased to 9.83 per cent which was marginally higher than its share during 70s. This has been mainly due to the growing awareness of the new opportunities and several product/capacity adjustments carried out by entrepreneurs within the country. This shift in the directional pattern of Indian engineering exports is an indication of the growing acceptance of our products in the developed world.

Again, payment conditions in a large number of countries, the Iran-Iraq war over a period of 8 years and political turmoil in neighbouring countries have also contributed to the low profile of India's engineering exports to Asian countries.

Percentage-wise, it can be seen from Table 7.2 that the imports of India's engineering goods by the countries of South East Asia declined from 34.27 per cent in 1956-57 to 20.43 per cent in 1990-91. In the case of West Asia it declined from 38.58 per cent in 1956-57 to 7.43 per cent in 1990-91. Similar trends could be seen in the case of Africa whose share declined from 23.23 per cent in 1956-57 to 10.03 per cent in 1990-91.

Table 7.2: Regional Distribution of India's Exports of Engineering Goods: Selected Years

(In percentages)

Sl. No.	Region	1956-57	1960-61	1966-67	1970-71	1976-77	1980-81	1986-87	1990-91	1993-94
1.	South East Asia	34.27	42.36	27.27	22.34	21.20	26.60	15.11	20.43	33.37
2.	West Asia	38.58	27.50	21.76	21.70	36.00	21.10	12.79	7.43	12.73
3.	Africa	23.23	19.13	20.36	29.90	14.40	19.70	10.70	10.03	10.35
4.	East Europe	--	0.05	9.70	5.30	8.10	9.00	29.07	25.28	2.73
5.	West and Other European Countries	0.21	5.49	9.26	14.00	11.60	10.80	7.10	15.00	13.92
6.	North America	0.13	2.23	7.57	4.5	6.6	9.2	10.96	10.43	10.97
7.	South America	0.03	1.09	1.15	0.28	0.42	--	--	1.36	3.80
8.	Oceanic Island	1.96	0.99	1.09	0.40	0.60	0.30	0.10	--	--
9.	Australia	1.37	0.71	1.49	1.80	1.30	1.40	1.49	4.14	2.73
	All Regions	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta

The countries of Europe and America, on the other hand, increased their purchase of engineering goods from India during the same period. East Europe, which was not an important importer of India's engineering goods in 1956-57, accounted for 29.07 per cent in 1986-87. North America increased their imports from 0.13 per cent in 1956-57 to 10.43 per cent in 1990-91. The importance of Eastern European countries started declining. The relative share declined to 2.73 per cent during 1993-94 from 29.07 per cent in 1986-87 and 25.28 per cent in 1990-91. Table 7.2 gives the detailed information about this. Thus the regional distribution of India's exports of engineering goods over time shows that a substantial market for these goods was found in the advanced countries of Europe and America.

To provide further evidence to this regional pattern a statistical analysis of the growth rates is attempted for the period 1970-71 to 1993-94. Exponential fit is used for the principal regions in terms of value by using the formula

$$Y = A + Bt + e$$

Table 7.3: Exponential Growth Rates of Engineering Exports by Economic Regions 1970-71 to 1987-88

	1970-71 to 1980-81	R^2	1981-82 to 1987-88	R^2	1970-71 to 1987-88	R^2
Asia	23.17 (9.89)	0.91	-2.85 (-1.32)	0.25	11.19 (5.71)	0.67
Africa	20.48 (8.46)	0.88	-5.39 (-3.51)	0.71	11.54 (6.60)	0.73
Europe	21.88 (13.81)	0.95	12.58 (4.29)	0.79	17.89 (19.57)	0.95
America	30.10 (12.766)	0.94	14.56 (4.08)	0.76	19.48 (11.19)	0.88
Australia	19.09 (8.37)	0.88	0.82 (0.16)	0.005	11.98 (7.75)	0.79
Oceanic Islands	21.99 (3.83)	0.61	--	--	--	--

Figures in brackets represent 't' values.

Source: Basic Data are from Engineering Export Promotion Council, Calcutta.

Table 7.4: Exponential Growth Rates of Engineering Exports by Economic Regions 1988-89 to 1993-94

Economic Regions	1988-89 to 1993-94	R^2
Asia	43.99 (26.51)	0.99
Africa	31.08 (21.20)	0.99
Latin America	54.36 (7.77)	0.93
North America	30.40 (38.99)	0.99
West Europe	33.65 (9.78)	0.95
Other Developed Regions	49.44 (7.25)	0.92
Eastern Europe	-14.95 (-1.13)	0.24

Figures in bracket represent 't' values.

Source: Basic Data are from Engineering Export Promotion Council, Calcutta.

Table 7.5: Regionwise Engineering Goods Exports

(Rs. in crore)

REGION	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
ASIA	50.97	58.44	71.26	105.60	201.74	230.30	315.82	325.57	347.77	373.44	425.74	466.55
a) South East Asia	25.86	32.87	40.09	57.93	22.80	117.74	117.17	135.16	179.13	199.61	232.63	190.89
b) West Asia	25.12	25.57	31.18	47.67	108.95	112.55	195.65	190.41	168.64	173.83	193.11	275.66
AFRICA	34.59	34.10	26.78	27.93	48.67	65.54	79.28	124.66	155.53	143.13	172.58	191.76
a) East Africa	7.93	10.11	7.64	11.98	22.68	23.15	25.83	61.53	70.00	67.69	74.01	70.11
b) Sub Sahara Africa												
i) North Africa	20.84	17.40	13.59	8.35	10.55	11.26	19.38	40.08	66.05	52.72	53.78	67.47
ii) West and Central Africa	5.81	6.56	5.56	7.61	15.44	31.13	24.07	23.05	19.48	22.72	44.79	54.18
EUROPE	22.28	24.48	30.85	43.40	58.92	81.42	108.58	118.27	142.68	127.28	173.35	219.62
a) East Europe	6.11	10.23	16.85	17.97	27.05	43.93	44.74	45.29	46.75	40.55	78.67	140.56
b) West Europe	16.17	14.25	14.00	25.44	31.87	37.48	63.85	13.60	95.93	86.73	94.68	79.06
AMERICA	5.23	4.51	9.35	12.52	28.84	22.67	36.45	42.30	58.18	76.10	80.31	70.42
AUSTRALIA	2.06	3.24	2.39	3.58	8.36	5.91	6.99	9.44	10.44	14.03	12.37	23.23
OCEANIC ISLANDS	0.44	0.50	0.44	0.45	2.58	2.39	4.56	3.10	2.33	2.70	2.19	5.67
OTHERS	--	--	--	--	--	--	--	--	--	--	7.63	69.74
TOTAL ENGINEERING EXPORTS	115.76	125.27	141.78	193.47	349.11	408.22	551.68	623.96	716.93	736.68	874.17	1046.99

(Contd.)

Table 7.5 Contd.

REGION	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
ASIA	370.43	395.00	410.00	330.00	336.00	405.00
a) South East Asia	158.00	180.00	195.00	155.00	182.00	--
b) West Asia	211.75	215.00	215.00	175.00	154.00	--
AFRICA	194.65	165.00	165.00	155.00	130.00	155.00
a) East Africa	73.33	65.00	55.00	65.00	66.00	--
b) Sub Sahara Africa						
i) North Africa	58.94	60.00	65.00	55.00	37.00	--
ii) West and Central Africa	52.38	40.00	45.00	35.00	27.00	--
EUROPE	295.87	240.00	385.00	290.00	436.00	515.00
a) East Europe	222.37	155.00	205.00	215.00	350.00	388.00
b) West Europe	73.50	85.00	100.00	75.00	86.00	127.00
AMERICA	59.11	90.00	140.00	110.00	132.00	150.00
AUSTRALIA	11.23	12.00	15.00	15.00	18.00	17.00
OCEANIC ISLANDS	1.41	8.00	10.00	5.00	1.00	3.00
OTHERS	78.60	90.00	110.00	190.00	150.73	110.00
TOTAL ENGINEERING EXPORTS	1011.30	1000.00	1155.00	1095.00	1203.73	1355.00

(Contd.)

Table 7.5 Contd.

REGION	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
ASIA	472.00	703.00	975.00	1620.00	2790.00	4055.00
a) South East Asia	325.00	403.00	715.00	1040.00	1930.00	2935.00
a1) Neighbouring countries	162.00	155.00	280.00	355.00	565.00	755.00
a2) ASEAN	110.00	178.00	340.00	505.00	825.00	1095.00
b) West Asia	147.00	300.00	260.00	580.00	860.00	1120.00
AFRICA	200.00	287.00	351.00	525.00	755.00	910.00
a) East Africa	95.00	142.00	178.00	235.00	285.00	395.00
b) North Africa	47.00	75.00	78.00	110.00	180.00	280.00
c) West and Central Africa	58.00	70.00	95.00	100.00	290.00	235.00
LATIN AMERICA AND OTHERS	33.00	32.00	54.00	130.00	285.00	335.00
a) Central & South America	29.00	25.00	48.00	85.00	170.00	240.00
b) Others	4.00	7.00	6.00	45.00	115.00	95.00

(Contd.)

Table 7.5 Contd.

REGION	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
NORTH AMERICA	215.00	287.00	365.00	520.00	725.00	965.00
WEST EUROPE	255.00	376.00	525.00	900.00	1165.00	1225.00
a) EEC	230.00	312.00	415.00	770.00	1040.00	1165.00
b) Other West Europe	25.00	64.00	110.00	130.00	125.00	60.00
OTHER DEVELOPED COUNTRIES	40.00	95.00	145.00	350.00	360.00	480.00
EASTERN BLOCK	374.00	570.00	885.00	705.00	225.00	240.00
OTHERS	--	--	200.00	275.00	445.00	585.00
TOTAL ENGINEERING EXPORTS	1589.00	2350.00	3500.00	5025.00	6780.00	8795.00

Source: Compiled from Engineering Export Promotion Council Data Sheets, various issues, Calcutta

Table 7.6: Regionwise India's Engineering Goods Exports

(In percentage)

REGION	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
ASIA	44.1	46.7	50.5	54.6	57.8	56.4	57.2	52.1	48.5	50.7	48.7	44.6
a) South East Asia	22.3	26.3	28.4	29.9	26.6	28.8	21.2	21.7	25.0	27.1	26.6	18.2
b) West Asia	21.7	20.4	22.1	24.7	31.2	27.6	36.0	30.4	23.5	23.6	22.1	26.3
AFRICA	29.9	27.2	19.0	14.4	13.9	16.1	14.4	20.0	21.7	19.4	19.7	18.3
a) East Africa	6.9	8.0	5.4	6.2	6.5	5.7	16.5	9.9	9.8	9.1	8.4	6.9
b) Sub Sahara Africa												
i) North Africa	18.0	14.0	9.7	4.3	3.0	2.8	3.5	6.4	9.2	7.2	6.2	6.4
ii) West and Central Africa	5.0	5.2	3.9	3.9	4.4	7.6	4.4	3.7	2.7	3.1	5.1	5.2
EUROPE	19.3	19.5	21.9	22.4	16.9	19.9	19.7	19.1	19.9	17.3	19.8	20.9
a) East Europe	5.3	8.2	12.0	9.3	7.8	10.8	8.1	7.3	6.5	5.5	9.0	13.4
b) West Europe	14.0	11.3	9.9	13.1	9.1	9.1	11.6	11.8	13.4	11.8	10.8	7.6
AMERICA	4.5	3.6	6.6	6.5	8.3	5.6	6.6	6.8	8.1	10.3	9.2	6.7
AUSTRALIA	1.8	2.6	1.7	1.9	2.4	1.4	1.3	1.5	1.5	1.9	1.4	2.2
OCEANIC ISLANDS	0.4	0.4	0.3	0.2	0.7	0.6	0.8	0.5	0.3	0.4	0.3	0.5
OTHERS	--	--		--	--	--	--		--	--	0.9	7.2
TOTAL %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

(Contd.)

Table 7.6 Contd.

REGION	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
ASIA	36.6	39.5	35.5	30.1	27.9	29.8
a) South East Asia	15.7	18.0	17.0	14.1	15.1	--
b) West Asia	20.9	21.5	18.7	15.9	12.8	--
AFRICA	18.3	16.5	14.3	14.15	10.7	11.4
a) East Africa	7.3	6.5	4.8	5.9	5.4	--
b) Sub Sahara Africa						
i) North Africa	8.8	6.0	5.7	5.0	3.1	--
ii) West and Central Africa	5.2	4.0	3.9	3.2	2.2	--
EUROPE	29.3	24.0	26.4	26.5	36.2	38.0
a) East Europe	22.0	15.5	17.8	19.6	29.1	28.6
b) West Europe	7.3	8.5	8.7	6.8	7.1	9.4
AMERICA	5.8	9.0	12.1	10.0	10.0	11.0
AUSTRALIA	1.1	1.2	1.3	1.4	1.4	1.3
OCEANIC ISLANDS	0.1	0.8	0.9	0.5	0.1	0.2
OTHERS	8.8	9.0	9.5	17.4	12.5	8.2
TOTAL %	100.00	100.00	100.00	100.00	100.00	100.00

(Contd.)

Table 7.6 Contd.

REGION	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
ASIA	29.7	29.9	27.9	32.2	41.2	46.1
a) South East Asia	20.4	17.1	20.4	20.7	28.5	33.4
a1) Neighbouring countries	10.2	6.6	8.0	7.1	8.3	8.6
a2) ASEAN	6.9	7.6	9.7	10.1	12.2	12.5
a3) Other South East Asian Countries	3.3	2.9	2.7	3.6	7.9	12.3
b) West Asia	9.3	12.8	7.4	11.5	12.7	12.7
AFRICA	12.6	12.2	10.0	10.5	11.1	10.4
a) East Africa	5.9	6.0	5.1	4.7	4.2	4.5
b) North Africa	2.9	3.2	2.2	2.2	2.7	3.2
c) West and Central Africa	3.7	2.9	2.7	3.6	4.3	2.7
LATIN AMERICA AND OTHERS	2.1	1.4	1.5	2.6	4.2	3.8
a) Central & South America	1.8	1.1	1.4	1.7	2.5	2.7
b) Others	0.3	0.3	0.2	0.9	1.7	1.1

(Contd.)

Table 7.6 Contd.

REGION	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
NORTH AMERICA	13.5	12.2	10.4	10.4	10.7	10.9
WEST EUROPE	16.1	16.0	15.0	17.9	17.2	13.9
a) EEC	14.5	13.3	11.9	15.3	15.3	13.3
b) Other West Europe	1.6	2.7	3.1	2.6	1.8	0.7
OTHER DEVELOPED COUNTRIES	2.5	4.0	4.1	6.9	5.3	2.7
EASTERN BLOCK AND OTHERS	23.5	24.3	25.3	14.9	3.3	2.7
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

Source: Basic Data are from Engineering Export Promotion Council, Calcutta.

The rates of growth of imports of engineering goods from India are consistently higher for Europe and America than for Asia and Africa. The rates of growth for these regions are higher for both for the 24 year period and for the sub-periods (See Tables 7.3 and 7.4).

The above analysis is an evidence that India has diversified her exports of engineering goods over the period regionally and that the excessive dependence on the markets of Asia and Africa was on the decline. In terms of their relative shares an increase in their imports from India, Europe and America showed more buoyancy than Asia and Africa.

The complete data regarding regionwise Engineering exports from 1970-71 to 1993-94 is given in Tables 7.5 and 7.6.

CHAPTER VIII

DIRECTION OF INDIA'S ENGINEERING EXPORTS: COUNTRY-WISE ANALYSIS

India is witnessing good economic progress due to the liberalisation and many regional trade agreements have been entered into. The Indian exporters have given particular attention to engineering goods. Hence this chapter analyses, in detail, the direction of engineering goods exports. This has been divided into two parts. The first part deals with India's dependence on different market economies; and the second shows the growth rates of some selected economies of the world.

India's Dependence on Different Market Economies

To analyse the trends in engineering exports, an attempt is made to analyse the direction of exports by country-wise destinations. Indian engineering goods are exported to over 100 countries, both developed and developing. Although Asia and Africa still constitute the major markets, there has been a gradual rise in the export of engineering goods to the western world. This has been possible mainly due to the growing awareness of new opportunities and several product adaptations and developments carried out by the entrepreneures within the country. India's principal markets for engineering goods are as follows:

	Region	Principal Markets
I.	South East Asia	- Malaysia, Thailand, Indonesia, Singapore, Sri Lanka and Japan
II.	West Asia	- UAE, Iraq, Kuwait, Saudi Arabia, Iran and Bahrain
III.	Africa	- Egypt, Nigeria, Kenya, Tanzania, Zambia, Uganda, Sudan and Ghana
IV.	North America	- USA and Canada
V.	South America	- Chile, Argentina, Brazil, Columbia etc.
VI.	Australia	- Australia and New Zealand
VII.	West Europe	- Germany, United Kingdom, France and Italy
VIII.	East Europe	- Erstwhile USSR.

Table 8.1: Percentage Share of Some Traditional Markets of Asia in India's Engineering Exports: Selected Years

COUNTRY	1956-57	1960-61	1966-67	1970-71	1976-77	1980-81	1986-87	1990-91	1993-94
Burma	11.78	6.51	1.71	1.66	0.40	0.20	neg.	0.51	0.73
Indonesia	1.27	1.10	0.13	1.43	2.40	2.90	0.70	2.00	2.16
Malaysia	6.00	6.92	5.79	2.80	2.00	3.00	1.20	2.50	2.80
Sri Lanka	9.54	9.78	3.88	5.59	2.90	0.20	1.40	2.70	3.77
Thailand	1.14	1.84	1.65	2.53	1.70	2.50	0.90	1.34	2.30
Kuwait	9.76	6.12	5.61	2.71	6.90	2.00	1.50	0.28	0.58
Saudi Arabia	11.28	3.02	1.53	1.62	4.60	5.30	3.90	1.34	1.50
Iran	0.72	1.66	7.32	9.06	5.20	4.90	1.00	0.80	1.80
Iraq	1.99	3.99	3.18	3.68	5.80	3.00	3.00	0.60	--
Bangladesh	0.01	0.68	0.75	0.10	1.10	1.00	1.90	2.70	3.97

Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta

The shares of Asian countries in India's exports and the growth rates of exports from India to these countries during the period are given in Table 8.1.

It can be observed from Tables 8.1 and 8.2 that the shares of most of the countries of Asia in India's exports of engineering goods have declined sharply over time, particularly in the eighties, excepting Bangladesh and one or two other small countries. The fall has been particularly high in the case of Saudi Arabia, Sri Lanka, Iran, Iraq, Indonesia and Thailand.

I. South East Asia

Among all the South-East Asian countries, the six countries comprising the Association of South East Asian Nations (ASEAN) have the best scope for India's engineering products. An Industrial Mission (Lajpati Rai, 1990) which visited these countries in May 1988 had indicated that Indian products such as steel castings and forgings, agricultural machinery and tractors, food processing machinery, machine tools, sanitary castings, seamless tubes, consultancy for chemical and petrochemical plants, electric power machinery and switchgear, wires and cables, complete commercial vehicles, auto and cycle parts,

TABLE 8.2: INDIAN ENGINEERING GOODS EXPORTS TO SOUTH AND EAST ASIA - COUNTRY-WISE MARKETS

(Rs. in crore)

COUNTRY	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
NEIGHBOURING COUNTRIES												
BANGLADESH	0.52 (0.4)	1.60 (1.3)	11.51 (8.2)	10.19 (5.3)	13.04 (3.7)	18.58 (4.6)	26.15 (4.7)	17.18 (2.8)	23.48 (3.3)	28.97 (3.9)	45.37 (5.2)	37.96 (3.6)
NEPAL	2.81 (2.4)	3.12 (2.5)	4.43 (3.1)	4.40 (2.3)	7.54 (2.2)	9.27 (2.3)	8.44 (1.5)	10.23 (1.6)	10.20 (1.4)	12.00 (1.6)	16.84 (1.9)	14.35 (1.4)
SRI LANKA	6.47 (5.6)	6.10 (4.9)	4.11 (2.9)	4.88 (2.5)	7.09 (2.0)	10.63 (2.6)	15.75 (2.9)	26.88 (4.3)	39.41 (5.5)	39.09 (5.3)	31.60 (4.8)	25.10 (2.4)
BURMA & OTHERS	1.92 (1.7)	1.95 (1.6)	0.74 (0.5)	0.32 (0.2)	0.62 (0.2)	1.70 (0.4)	1.79 (0.3)	3.91 (0.6)	8.63 (1.2)	9.56 (1.2)	22.25 (2.55)	17.33 (1.66)
ASEAN COUNTRIES												
INDONESIA	1.65 (1.4)	1.66 (1.3)	2.99 (2.1)	3.84 (2.0)	9.26 (2.7)	12.04 (2.9)	13.20 (2.4)	18.90 (3.0)	13.75 (1.9)	17.33 (2.4)	25.49 (2.9)	23.04 (2.2)
MALAYSIA	2.53 (2.2)	4.60 (3.7)	4.76 (3.4)	11.34 (5.9)	17.92 (5.1)	16.62 (4.1)	10.87 (2.0)	16.86 (2.7)	22.82 (3.2)	28.62 (3.9)	26.32 (3.0)	16.99 (1.0)
PHILIPPINES	0.79 (0.7)	1.07 (0.9)	0.76 (0.5)	1.68 (0.9)	2.46 (0.7)	9.53 (2.3)	5.80 (1.1)	2.90 (0.5)	6.80 (0.9)	4.12 (0.6)	2.54 (0.3)	1.97 (0.2)
SINGAPORE	3.40 (2.9)	4.07 (3.3)	4.95 (3.5)	7.43 (3.8)	9.29 (2.7)	9.56 (2.3)	12.72 (2.3)	13.91 (2.2)	18.40 (2.6)	16.75 (2.3)	16.92 (1.9)	20.02 (1.9)
THAILAND	2.93 (2.5)	2.77 (2.2)	3.26 (2.3)	3.64 (1.9)	8.12 (2.3)	6.62 (1.6)	9.16 (1.7)	10.86 (1.7)	11.06 (1.5)	11.55 (1.6)	21.58 (2.5)	20.73 (2.0)

(CONTD.)

Table 8.2 Contd.

COUNTRY	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
OTHER SOUTH EAST ASIAN COUNTRIES												
JAPAN	0.11 (0.1)	0.20 (0.2)	0.46 (0.3)	3.92 (2.0)	3.84 (1.1)	7.08 (1.7)	6.03 (1.1)	1.32 (0.2)	3.15 (0.4)	1.49 (0.2)	8.93 (1.0)	14.46 (1.4)
CHINA	---	--	--	--	--	--	--	--	--	--	--	--
HONG KONG	1.54 (1.4)	1.68 (1.3)	1.84 (1.3)	3.98 (2.1)	4.61 (1.3)	2.46 (0.6)	5.33 (1.0)	3.69 (0.6)	4.05 (0.6)	5.57 (0.6)	3.59 (0.4)	5.54 (0.5)
TAIWAN	0.87 (0.7)	3.55 (2.8)	0.07 (0.0)	0.45 (0.2)	0.72 (0.2)	1.48 (0.4)	1.22 (0.2)	2.40 (0.4)	5.04 (0.4)	6.53 (0.9)	3.90 (0.4)	2.18 (0.2)
SOUTH KOREA	0.39 (0.3)	0.09 (0.1)	0.06 (0.0)	0.55 (0.3)	7.13 (2.0)	1.99 (2.9)	0.14 (0.03)	2.10 (0.3)	1.48 (0.2)	3.87 (0.5)	1.18 (0.1)	0.71 (0.1)
NORTH KOREA	--	--	--	--	--	--	--	--	--	--	--	--
VIETNAM	0.31 (0.3)	0.28 (0.2)	0.11 (0.1)	0.62 (0.3)	0.45 (0.1)	0.11 (0.03)	-- --	-- --	0.08 (0.01)	15.65 (2.1)	15.05 (1.7)	4.97 (0.5)
OTHERS	--	0.33 (0.26)	0.5 (0.35)	4.61 (2.38)	4.55 (1.30)	17.15 (4.20)	6.6 (1.19)	5.34 (0.86)	13.93 (1.94)	--	--	--

(CONTD.)

Table 8.2 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
NEIGHBOURING COUNTRIES												
BANGLADESH	17.80 (1.8)	25.00 (2.5)	30.00 (2.6)	35.00 (3.5)	65.00 (5.7)	63.00 (4.6)	67.00 (4.2)	105.00 (4.5)	150.00 (4.3)	133.00 (2.6)	180.00 (2.6)	230.00 (2.6)
NEPAL	--	--	--	--	--	30.00 (2.2)	28.00 (1.8)	12.00 (0.5)	18.00 (0.5)	58.00 (1.15)	70.00 (1.03)	128.00 (1.45)
SRI LANKA	26.24 (2.6)	25.00 (2.5)	30.00 (2.6)	22.00 (2.2)	16.00 (1.4)	27.00 (1.9)	56.00 (3.5)	31.00 (1.3)	94.00 (2.7)	150.00 (2.9)	280.00 (4.12)	332.00 (3.77)
BURMA & OTHERS	--	--	--	--	--	8.00 (0.5)	11.00 (0.7)	7.00 (0.29)	18.00 (0.51)	14.00 (0.2)	35.00 (0.92)	65.00 (0.73)
ASEAN COUNTRIES												
INDONESIA	10.83 (1.1)	30.00 (3.0)	27.00 (2.3)	7.00 (0.7)	12.00 (1.0)	7.00 (0.5)	15.00 (0.9)	25.00 (1.06)	71.00 (2.0)	85.00 (1.69)	85.00 (1.25)	190.00 (2.16)
MALAYSIA	20.96 (2.1)	16.00 (1.6)	15.00 (1.3)	12.00 (1.2)	14.00 (1.2)	17.00 (1.25)	24.00 (1.5)	40.00 (1.7)	89.00 (2.5)	147.00 (2.9)	155.00 (2.2)	250.00 (2.8)
PHILIPPINES	--	--	--	--	--	1.00 (0.07)	7.00 (0.44)	8.00 (0.3)	12.00 (0.3)	23.00 (0.4)	45.00 (0.66)	60.00 (0.68)
SINGAPORE	15.67 (1.5)	20.00 (2.0)	23.00 (2.0)	18.00 (1.8)	19.00 (1.7)	19.00 (1.4)	39.00 (2.45)	75.00 (3.19)	121.00 (3.45)	195.00 (3.9)	385.00 (5.67)	390.00 (4.4)
THAILAND	8.00 (0.8)	7.50 (0.8)	6.00 (0.5)	7.00 (0.7)	10.00 (0.9)	11.00 (0.8)	25.00 (1.57)	30.10 (1.27)	47.00 (1.34)	55.00 (1.09)	155.00 (2.2)	205.00 (2.3)

(CONTD.)

Table 8.2 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
OTHER SOUTH EAST ASIAN COUNTRIES												
JAPAN	12.04 (1.2)	16.00 (1.6)	25.00 (2.2)	23.00 (2.3)	22.00 (1.9)	8.00 (0.5)	10.00 (0.6)	55.00 (2.3)	95.00 (2.7)	290.00 (5.7)	277.00 (4.0)	350.00 (3.90)
CHINA	--	--	--	--	--	--	--	--	--	2.00 (0.03)	180.00 (3.5)	544.00 (6.18)
HONG KONG	--	--	--	--	--	--	--	31.00 (1.3)	37.00 (1.05)	37.00 (0.7)	65.00 (0.9)	115.00 (1.30)
TAIWAN	--	--	--	--	--	--	11.00 (0.7)	--	--	68.00 (1.35)	145.00 (2.13)	250.00 (2.8)
SOUTH KOREA	--	--	--	--	--	8.00 (0.6)	11.00 (0.7)	39.00 (1.65)	58.00 (1.65)	49.00 (0.97)	90.00 (1.32)	84.00 (0.95)
NORTH KOREA		--	--	--	--	--	--	--	--	19.00 (0.3)	28.00 (0.36)	58.00 (0.65)
VIETNAM	--		--	--	--	--	--	--	--	4.00 (0.07)	25.00 (0.36)	29.00 (0.32)
OTHERS	--	--	--	--	--	--	--	--	--	1.00 (0.02)	7.00 (0.10)	5.00 (0.05)

Note Figures in brackets represent percentage values.
Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta.

aluminium products and diesel engines have tremendous scope of exports to these middle income countries.

It is equally necessary that India should increase the awareness among the importers in these countries about the progress in technoloy, quality-control and sophistication that has been achieved by us. Indian exporters also need to improve their liaison with the officials of Asian Development Bank (ADB), so that they will be able to get more projects funded by this multilateral institution.

It is a fact that Indian engineering exports to the Asian countries have failed to keep up the promise which they had held earlier. In this, both the industry and the government had to share equal responsibility. Therefore, it is even now not too late, for these two bodies, to pool their resources to increase the presence of Indian products and enhance the image of Indian industry.

The Singapore Trade Development Board has also formulated a four-point-strategy for boosting trade with India. The major focus here is on promoting the use of Singapore as a market base for Indian goods, increasing exports of Marine and Ocean engineering products, building up infrastructure and providing counter trade services (Srinivasan, 1990).

India can make a better performance in the Singapore market, provided Indian firms launch an all out market drive and supply quality goods on schedule. Export opportunities in selected neighbouring and Asian countries is given in Appendix I and II.

The details regarding some of the Indian exports to the major countries of the region are given below:

1. Malaysia

In 1961-62, engineering goods exports to Malaysia accounted for 12.1 per cent of India's total exports to Malaysia. In the year 1977-78, this share rose to 50 per cent. In this year export of engineering goods accounted for Rs.16.86 crore out of a total export of Rs.33.46 crore. In the year 1991-92, the share of engineering goods zoomed to Rs.147 crore, but its share in the total exports dropped to 30 per cent (See Table 8.3).

2. Thailand

Trade with Thailand was rather unsteady. Non-

Table 8.3: Position of Engineering Goods in India's Overall Export to Malaysia

Year	Total Exports	Export of Engineering goods	% Share of Col.3 to Col.2
1977-78	33.46	16.86	50.00
1980-81	51.00	26.32	51.60
1982-83	52·00	20.96	40.30
1983-84	62.00	16.00	25.80
1984-85	77.00	15.00	19.48
1985-86	128.00	12.00	9.37
1986-87	104.00	14.00	13.46
1987-88	90.00	17.00	89.47
1988-89	131.00	24.00	18.32
1989-90	176.00	40.00	22.72
1990-91	271.00	89.00	32.84
1991-92	498.98	147.00	29.46
1992-93	550.00	155.00	28.18
1993-94	776.00	250.00	32.22

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

availability of exchangable commodities and indifferent political relations were largely responsible for this. Although, Thailand is generally averse to bilateral agreements, and as such we must try to exploit this market by offering quality and cost effective products.

Available data show that engineering goods exports to Thailand is steadily going up from the nominal amount of Rs.21.58 crore in 1980-81 to Rs.205 crore in 1993-94.

3. Indonesia

Although total export trade volume to Indonesia is not very impressive in comparison with other South East Asian countries, she is the biggest importer of Indian engineering goods in South East Asia. In 1961-62, India exported engineering goods worth Rs.17.55 lakh to Indonesia, which formed 2.5 per cent of India's total exports to Indonesia. In the year 1993-94, the picture was quite different and export of engineering goods amounted to Rs.190 crore in that year.

It is a point to be noted that Indonesia's external trade is largely influenced by credit availability. So India must be prepared to extend credit facilities as is done by USA, Japan, the UK and Holland in enhancing trade with Indonesia. There is a market for rice milling machinery, sugar and cement machinery. About one third of India's imports comprise of capital goods. There is a potential for export of engineering products (Agarwal, 1978).

4. Singapore

Singapore is the biggest overall importer of Indian goods in South East Asia. Important export items of traditional category are - cotton textiles, jute products, fish preparations, fruits and vegetables, sugar, coir manufacturers, spices, hides and skins and mangenese ore. In the non-traditional items, engineering goods rank first. In the year 1961-62, export of engineering goods to Singapore was negligible. After that the scene has changed. In the year 1970-71, the contribution of engineering goods to total export accounted for 20 per cent. In the year 1991-92, the contribution of engineering goods remained at 20 per cent, but export earnings from engineering goods rose to Rs.195 crore in the total export earnings of Rs.955 crore (See Table 8.4).

5. Sri Lanka

Sri Lanka is one of our closest neighbours. We

Table 8.4: Position of Engineering Goods in India's Overall Export to Singapore

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Col.3 to Col.2
1960-61	7.15	0.76	10.62
1969-70	15.84	2.23	14.07
1970-71	17.63	3.46	19.62
1975-76	51.04	9.56	18.73
1976-77	57.62	12.72	22.07
1977-78	68.47	13.91	20.31
1980-81	109.00	16.81	15.42
1987-88	273.00	19.00	6.95
1988-89	322.00	39.00	12.11
1989-90	461.00	75.00	16.27
1990-91	681.00	121.00	17.77
1991-92	958.49	195.00	20.35
1992-93	1705.00	385.00	22.58
1993-94	2359.00	390.00	16.53

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

Table 8.5: Position of Engineering Goods in India's Overall Export to Sri Lanka

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Col.3 to Col.2
1980-81	81	31.60	39.01
1982-83	82	26.24	32.00
1983-84	102	25.00	24.50
1984-85	127	30.00	23.62
1985-86	83	22.00	26.50
1986-87	87	16.00	18.39
1987-88	103	27.00	26.21
1988-89	147	56.00	38.09
1989-90	97	31.00	31.95
1990-91	235	94.00	40.00
1991-92	429	150.00	34.96
1992-93	718	280.00	38.99
1993-94	903	332.00	36.77

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

have trade relations with Sri Lanka from 5th Century BC onwards. In the year 1980-81, the contribution of engineering goods to total exports was 39.01 per cent. In the year 1991-92, this declined to 34.96 per cent, but export earnings from engineering goods rose to Rs.150 crore in the total export earnings of Rs.429 crore (See Table 8.5).

6. Japan

Eventhough Japan is an Asian country and has age old links with India dating back to the first and second centuries AD, she has a great parallelism with countries of Western Europe.

In the year 1980-81, the share of engineering goods exports to total exports to Japan was only 1.5 per cent while the total exports amounted to Rs.598 crore. During 1982-83 though this share went upto 5.16 per cent, it recorded a fall in the years that followed and touched the lwwest point of 0.46 per cent during 1988-89. Later, it showed signs of revival and in 1989-90, 1990-91 and 1991-92 an increasing trend can be seen with the share of engineering exports to total exports rising to 2.01, 3.13 and 7.16 per cent respectively. All through these years

Table 8.6: Position of Engineering Goods in India's Overall Export to Japan.

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	598	8.93	1.50
1982-83	233	12.04	5.16
1983-84	829	16.00	1.93
1984-85	1029	25.00	2.42
1985-86	1164	23.00	1.97
1986-87	1341	22.00	1.60
1987-88	1615	8.00	0.49
1988-89	2154	10.00	0.46
1989-90	2727	55.00	2.01
1990-91	3039	95.00	3.13
1991-92	4071	290.00	7.12
1992-93	4160	277.00	6.66
1993-94	5461	350.00	6.41

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

the engineering exports were growing substantially and during 1991-92 India exported goods worth Rs.290 crore to Japan (See Table 8.6).

Among the engineering exportables, bicycles have made little presence in Japanese markets. Although India is a large supplier of bicycles and parts to many other nations, its image has not been properly presented in the Japanese markets and there remains a considerable gap in India's export capabilities and the Japanese market potential. Japanese import statistics, so far, do not indicate import of bicycles and bicycle parts from India.

Moreover, imports of bicycle components, which are around 2000 million yen annually, account for nearly 3 to 4 per cent of the total imports of bicycle components by Japan. The major supplying countries are France, Italy, USA, UK and South Korea. The main reason for India's poor performance in this field is the low quality of the bicycle components compared to the other importers.

India's efforts to export complete bicycles as well as bicycle components to Japan will yield dividents if only manufactures adhere to strict quality standards as laid down in the "Japan industrial standards". In the Japanese market, the challenges and opportunities for India's engineering exports are of a different nature. In spite of the fact that Japan has well-developed and efficiently-organised industries of its own, it imports substantial quantities of engineering products. However, its imports are only in those areas where local production is uncompetitive. Quality is of paramount importance to this market, and therefore, import demand is for "zero-defect products" (Varma, 1988).

The labour costs in Japan have been increasing and have reached European levels. As a result of this the Japanese have established their manufacturing facilities and collaboration arrangements in Singapore, South Korea and Hong Kong. But with rising labour costs even in the latter three, they have now begun to realise that they might have to sub-contract with dependable Indian firms who can assure them the proper deliveries with adherence to specifications and competitive prices. In many labour intensive areas of intermediate technology, including light engineering goods, India could well team up with Japan. There is great scope for increasing trade and collaboration with Japan in the coming years and India would do well to avail of the emerging opportunities.

II. West Asia

West Asia has now became the leading trade partner of India. Countries of this region offer considerable scope for the expansion of Indian exports. This is very well reflected in the export of engineering products from India. In the seventies India attained commendable heights in the overall exports to West Asian countries and that was largely attributed to the highest percentage contribution of engineering goods to the total exports. Most of the countries in this region are technically not sound and they are badly in need of many types of engineering products for the construction of key industries as well as turn key projects. There are a number of countries in this region which import more than 60 per cent of engineering goods in their total imports.

Details regarding engineering exports to West Asia is given in Table 8.7 and Export opportunities in selected West Asian countries is given in Appendix III.

The details of exports to some of the important countries in this region are given below:

1. The United Arab Emirates (UAE)

After the 70s the UAE has emerged as the largest importer of the Indian engineering goods. In the year 1965-

TABLE 8.7: INDIAN ENGINEERING GOODS EXPORTS TO WEST ASIA - COUNTRY-WISE MARKETS

(Rs. in crore)

COUNTRY	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
BAHRAIN	0.39 (0.3)	0.62 (0.5)	0.63 (0.4)	0.99 (0.5)	2.24 (0.6)	4.53 (1.1)	7.04 (1.3)	6.27 (1.0)	7.32 (0.7)	3.27 (0.4)	4.39 (0.5)	7.25 (0.7)
IRAN	10.49 (9.1)	10.21 (8.2)	10.09 (7.2)	13.38 (6.9)	16.85 (4.8)	22.47 (5.5)	28.45 (5.2)	32.54 (5.2)	23.84 (3.3)	25.86 (3.5)	42.62 (4.9)	65.52 (6.3)
JORDAN	0.56 (0.5)	0.54 (0.4)	1.36 (1.0)	1.55 (0.8)	1.33 (0.4)	0.85 (0.2)	4.84 (0.9)	2.43 (0.4)	4.10 (0.6)	2.15 (0.3)	2.14 (0.2)	3.72 (0.4)
IRAQ	4.26 (3.7)	2.97 (2.4)	4.45 (3.2)	7.72 (4.0)	38.33 (11.0)	23.83 (5.8)	19.14 (3.5)	15.36 (2.5)	18.32 (2.6)	21.51 2.9)	25.82 (3.0)	53.89 (5.1)
KUWAIT	3.14 (2.7)	3.85 (3.1)	4.93 (3.5)	4.17 (2.2)	11.14 (3.2)	11.88 (2.9)	38.20 (6.9)	28.89 (4.6)	24.96 (3.5)	18.27 (2.5)	17.48 (2.0)	24.06 (2.3)
OMAN	0.23 (0.2)	0.60 (0.5)	0.77 (0.5)	2.43 (1.3)	5.81 (1.7)	5.79 (1.4)	8.51 (1.5)	8.86 (1.4)	6.53 (0.6)	8.65 (1.2)	9.31 (1.1)	14.41 (1.4)
QATAR	0.86 (0.7)	0.74 (0.6)	0.75 (0.5)	1.80 (0.9)	1.37 (0.4)	3.27 (0.8)	4.54 (0.8)	6.90 (1.1)	5.54 (0.8)	4.03 (0.5)	7.21 (0.8)	10.53 (1.0)
SAUDI ARABIA	1.94 (1.7)	2.08 (1.7)	3.22 (2.3)	6.73 (3.5)	10.41 (3.0)	15.51 (3.8)	25.43 (4.6)	35.22 (5.6)	38.69 (5.4)	45.93 (6.2)	46.06 (5.3)	43.91 (4.2)
SYRIA	0.55 (0.5)	0.51 (0.4)	0.33 (0.2)	0.17 (0.2)	1.14 (0.3)	1.18 (0.3)	2.24 (0.4)	2.17 (0.3)	2.68 (0.4)	3.80 (0.5)	3.03 (0.3)	4.22 (0.4)
UAE	1.06 (0.9)	1.48 (1.2)	2.20 (1.6)	5.97 (3.1)	14.54 (4.2)	15.77 (3.9)	46.39 (8.4)	39.21 (6.3)	21.84 (3.0)	20.74 (2.8)	20.93 (2.4)	31.94 (3.1)
YAR	--	--	--	--	0.73 (0.2)	1.74 (0.4)	8.97 (1.6)	7.68 (1.2)	10.52 (1.5)	10.38 (1.4)	9.63 (1.1)	9.40 (0.9)
LEBANON & OTHERS	1.64 (1.43)	2.56 (2.02)	2.45 (1.75)	5.21 (1.43)	5.06 (1.44)	5.73 (1.64)	4.9 (0.88)	4.88 (0.81)	4.29 (0.62)	0.64 (0.1)	1.55 (0.2)	0.48 (0.05)

(Contd.)

Table 8.7 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
BAHRAIN	5.58 (0.6)	9.00 (0.9)	8.50 (0.7)	5.00 (0.5)	6.00 (0.5)	3.00 (0.22)	3.00 (0.18)	6.00 (0.2)	6.00 (0.17)	22.00 (0.43)	23.00 (0.33)	29.00 (0.3)
IRAN	38.75 (3.8)	32.00 (3.2)	35.00 (3.0)	11.00 (1.1)	12.00 (1.0)	19.00 (1.4)	10.00 (0.62)	53.00 (2.2)	28.00 (0.8)	97.00 (1.93)	135.00 (1.9)	168.00 (1.8)
JORDAN	1.80 (0.2)	2.00 (0.2)	1.50 (0.1)	2.00 (0.2)	5.00 (0.4)	3.00 (0.22)	7.00 (0.44)	8.00 (0.3)	16.00 (0.45)	17.00 (0.33)	32.00 (0.4)	.51.00 (0.5)
IRAQ	28.93 (2.9)	27.00 (2.7)	22.00 (1.9)	25.00 (2.5)	3.00 (0.3)	7.00 (0.5)	17.00 (1.06)	63.00 (2.6)	22.00 (0.6)	--	--	--
KUWAIT	21.84 (2.2)	19.00 (1.9)	19.00 (1.7)	20.00 (2.0)	17.00 (1.5)	7.00 (0.5)	10.00 (0.62)	26.00 (1.1)	10.00 (0.28)	38.00 (0.75)	76.00 (1.12)	49.00 (0.58)
OMAN	11.12 (1.1)	11.00 (1.1)	12.00 (1.0)	8.00 (0.8)	4.00 (0.3)	10.00 (0.7)	11.00 (0.7)	11.00 (0.46)	13.00 (0.37)	41.00 (0.8)	52.00 (0.76)	58.00 (0.65)
QATAR	8.35 (0.8)	6.00 (0.6)	8.50 (0.7)	6.00 (0.6)	5.00 (0.4)	5.00 (0.3)	3.00 (0.18)	5.00 (0.21)	4.00 (0.11)	7.00 (0.13)	14.00 (0.20)	17.00 (0.19)
SAUDI ARABIA	51.12 (5.1)	55.00 (5.5)	60.00 (5.2)	55.00 (5.5)	45.00 (3.9)	28.00 (2.0)	36.00 (2.26)	34.00 (1.4)	47.00 (1.34)	100.00 (1.9)	120.00 (1.76)	138.00 (1.5)
SYRIA	--	--		--	--	19.00 (1.4)	7.00 (0.44)	9.00 (0.38)	14.00 (0.4)	21.00 (0.4)	31.00 (0.45)	45.00 (0.51)
UAE	21.98 (2.2)	22.00 (2.2)	26.00 (2.3)	21.00 (2.1)	23.00 (2.0)	22.00 (1.5)	35.00 (2.2)	78.00 (3.3)	94.00 (2.7)	223.00 (4.43)	325.00 (4.79)	515.00 (5.85)
YAR	13.24 (1.3)	20.00 (2.0)	11.00 (1.0)	8.00 (0.8)	5.00 (0.4)	5.00 (0.3)	8.00 (0.50)	7.00 (0.29)	6.00 (0.17)	12.00 (0.23)	17.00 (0.25)	30.00 (0.34)
LABANON & OTHERS	--	--	--	--	--	--	--	--	3.00 (0.01)	2.00 (0.03)	10.00 (0.14)	23.00 (0.26)

Note: Figures in brackets represent percentage values.
Source: Compiled from Engineering Export Promotion Council Data Sheet various issues, Calcutta.

Table 8.8: Position of Engineering Goods in India's Overall Export to UAE.

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1960-61	5.41	0.17	3.14
1965-66	9.44	2.35	24.89
1970-71	26.65	1.06	3.97
1975-76	270.77	15.77	5.82
1976-77	144.58	46.39	32.08
1977-78	116.17	39.21	33.75
1978-79	93.51	21.84	23.35
1980-81	152.00	20.93	13.76
1982-83	199.00	21.98	11.04
1983-84	215.00	22.00	10.23
1984-85	254.00	26.00	10.23
1985-86	288.00	21.00	7.29
1986-87	287.00	23.00	8.01
1987-88	310.00	22.00	7.09
1988-89	425.00	35.00	8.23
1989-90	710.00	78.00	10.98
1990-91	787.00	94.00	11.94
1991-92	1820.00	223.00	12.45
1992-93	2359.00	325.00	13.78
1993-94	3632.00	515.00	14.18

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

66, India's total exports to UAE amounted to Rs.9.44 crore in which engineering goods were valued at Rs.2.35 crore. This accounted for 25 per cent of the total exports to UAE. The year 1991-92 recorded the highest total export earnings from the UAE. This year India's total exports amounted to Rs.1790 crore, in which engineering goods accounted for Rs.223 crore (12.45 per cent of the total exports to the UAE) (See Table 8.8).

It is a very promising market for Indian engineering goods. Big construction projects running into hundreds of crores are now available in Dubai. The present ruler of Dubai is also showing keen interest and taking personal pains in the industrial development of that country.

2. Iraq

Iraq was formerly called Mesopotamia. It has been one of the cradles of human civilisation. Our export trade to Iraq has been growing spectacularly in recent years (upto the Kuwait invasion of Iraq). Iraq is a major importer of Indian engineering goods. In the year 1965-66, India's total exports to Iraq was a meagre Rs.4.70 crore and the share of engineering goods in this was 29.4 per

Table 8.9: Position of Engineering Goods in India's Overall Export to Iraq

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1965-66	4.70	1.38	29.50
1969-70	9.39	3.07	31.60
1975-76	64.54	23.83	36.00
1976-77	46.51	19.14	41.00
1977-78	51.00	15.36	30.00
1980-81	52.00	25.82	49.65
1982-83	54.00	28.93	53.57
1983-84	52.00	27.00	51.92
1984-85	49.00	22.00	44.89
1985-86	35.00	25.00	71.42
1986-87	16.00	3.00	18.75
1987-88	18.00	7.00	38.88
1988-89	53.00	17.00	32.07
1989-90	126.00	63.00	50.00
1990-91	43.00	22.00	51.16
1991-92	--	N.A.	--
1992-93	17.19	N.A.	--
1993-94	12.00	N.A.	--

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

cent. In the year 1969-70, the export of engineering goods amounted to Rs.3.07 crore, while the total export was 9.39 crore. In the year 1975-76, the total exports to Iraq were valued at Rs.64.54 crore, in which the share of engineering goods was 36 per cent. During 1989-90 the share of engineering goods to total export rose to 50 per cent (See Table 8.9).

3. Kuwait

Situated in the richest oil belt of the Gulf region, Kuwait covers an area of about 16,000 sq. kms. The country is a very good market for engineering goods because of the construction works and turn-key projects. The British rulers gave them the taste of tea and so Indian tea also forms a major item in their import bill.

Kuwait has been the buyer of Indian engineering goods since 1956-57. In that year India exported engineering goods worth Rs.51.5 lakh out of a total export of Rs.3.76 crore (6.52 per cent). In the year 1969-70, the percentage share of engineering goods to total export to Kuwait was 30.7 per cent. In the year, 1975-76, the share of engineering goods declined to 26 per cent, and the total value of engineering goods touched the peak (Rs.11.88

Table 8.10: Position of Engineering Goods in India's Overall Export to Kuwait

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1960-61	3.42	0.64	18.71
1965-66	7.64	1.14	14.92
1969-70	16.87	5.19	30.76
1970-71	15.74	3.16	20.07
1975-76	45.36	11.88	26.19
1976-77	112.76	38.20	33.87
1977-78	112.74	28.89	25.62
1979-80	123.81	18.27	14.75
1980-81	97.00	17.48	18.02
1982-83	120.00	21.84	18.20
1983-84	110.00	19.00	17.27
1984-85	107.00	19.00	18.78
1985-86	122.00	20.00	16.39
1986-87	95.00	17.00	17.89
1987-88	106.00	7.00	6.60
1988-89	144.00	10.00	6.94
1989-90	198.00	26.00	13.13
1990-91	79.00	10.00	12.65
1991-92	129.00	38.00	29.45
1992-93	314.00	76.00	24.20
1993-94	332.00	49.00	14.76

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

crore). The total export in that year was Rs.45.36 crore. In the year 1991-92, the total export to Kuwait remained at the 1975-76 level, but the share of engineering ggods rose to 29 per cent (See Table 8.10).

4. Saudi Arabia

Saudi Arabia is the second biggest market for the Indian engineering goods. Prior to 1960-61, there was no export of engineering goods to Saudi Arabia. During 1960-61, India exported engineering goods worth Rs.32 lakh which formed 10 per cent of its total export to Saudi Arabia. During 1975-76, total Indian exports to Saudi Arabia amounted to Rs.59.79 crore, in which the share of engineering goods was 25 per cent, with a value of Rs.15.51 crore. During 1991-92, the net amount from engineering goods export rose to Rs.100 crore, but the percentage share of engineering goods in the total export declined from 34 per cent to 11.56 per cent (See Table 8.11).

We have so far made only a limited effort in this most challenging and promising market. There is considerable potential for increasing our economic co-operation and also for subcontracting and constructing projects.

Table 8.11: Position of Engineering Goods in India's Overall Export to Saudi Arabia

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1960-61	3.27	0.32	9.78
1965-66	6.23	0.55	8.82
1970-71	14.51	1.96	13.50
1975-76	59.79	15.51	25.94
1976-77	74.37	25.43	34.19
1977-78	123.97	35.22	28.41
1980-81	165.00	46.06	28.43
1982-83	227.00	51.12	23.52
1983-84	214.00	55.00	25.70
1984-85	272.00	60.00	22.05
1985-86	213.00	55.00	25.82
1986-87	219.00	45.00	20.54
1987-88	278.00	28.00	10.07
1988-89	323.00	36.00	11.15
1989-90	428.00	34.00	8.13
1990-91	418.00	47.00	11.24
1991-92	866.11	100.00	11.56
1992-93	1180.00	120.00	10.16
1993-94	1602.00	138.00	8.60

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

5. Iran

Iran has an age-old civilisation dating back to 'Darius and Xevxes' times and has had cultural and commercial links with India from time immemorial.

Iran has emerged as a promising market not only for engineering goods but also for India's overall exports. In the field of engineering goods, a real breakthrough occurred in the year 1968-69, when India exported engineering goods worth Rs.8.23 crore, which accounted for 37 per cent of India's total exports to Iran. In the year 1980-81, the export of engineering goods amounted to Rs.42.62 crore, which formed 45.81 per cent of total exports to Iran (See Table 8.12).

In the year 1991-92 India's total exports to Iran was as high as Rs.299 crore, in which engineering goods accounted Rs.17 crore. This accounted only 5.68 per cent of the total exports to Iran (See Table 8.10). Iran was one among the top ten markets for India's engineering exports during 60s, 70s and 80s. The annual average growth rates were 59.65 per cent, 12.17 per cent and (-) 5.67 per cent respectively in 60s, 70s and 80s. The negative annual average growth rate during 80s could be attributed to the

Table 8.12: Position of Engineering Goods in India's Overall Export to Iran

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1960-61	5.41	0.17	3.14
1965-66	9.44	2.35	24.89
1970-71	26.65	10.50	39.39
1975-76	270.77	22.47	8.29
1976-77	144.58	28.45	19.68
1977-78	116.17	32.55	28.02
1978-79	93.51	23.84	25.49
1980-81	123.00	42.62	45.81
1982-83	71.00	38.75	54.50
1983-84	126.00	32.00	25.30
1984-85	134.00	35.00	26.12
1985-86	95.00	11.00	11.57
1986-87	47.00	12.00	25.53
1987-88	139.00	19.00	13.66
1988-89	89.00	10.00	11.24
1989-90	132.00	53.00	40.15
1990-91	141.00	16.00	11.34
1991-92	302.05	17.00	5.68
1992-93	331.00	135.00	40.78
1993-94	501.00	165.00	32.93

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

political disturbances prevailed in that country. However, because of the cordial relations between the two countries and declining supply of engineering goods from the West European countries due to the estranged relations, India will be able to improve the export trade with Iran. Iran is an interestingly sophisticated market. There is very good scope for joint ventures in the area of setting up textile plants and light engineering industries.

III. Africa

For many years, tea, jute and cotton textiles have been India's major items of export to Africa. But their share in recent years has not been showing any sign of growth. After 1970-71, the engineering goods have overtaken our traditional exports. The share of engineering goods to total exports has increased from 5.97 per cent in 1965-66 to 58.75 per cent in 1989-90 (See Table 8.13).

There is a good scope for enlarging India's export of engineering goods to the oil-rich countries like Libya, Algeria and Nigeria, which are experiencing luxuriant economic boom. This is also true in the case of the developing African countries, in view of their rising

Table 8.13: Position of Engineering Goods in India's Overall Export to Africa

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1956-57	38.30	1.20	3.13
1960-61	73.30	1.97	2.68
1965-66	95.90	5.73	5.97
1970-71	138.20	34.36	24.80
1975-76	271.58	65.54	24.10
1980-81	345.00	172.58	50.01
1987-88	315.00	155.00	49.22
1988-89	398.00	200.00	50.25
1989-90	544.00	287.00	52.75
1990-91	706.00	351.00	49.71
1991-92	1411.35	525.00	48.03
1992-93	2124.00	755.00	35.55
1993-94	2612.00	910.00	34.84

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

Table 8.14 INDIAN ENGINEERING GOODS EXPORTS TO AFRICA - COUNTRY-WISE MARKETS

(Rs. in crore)

COUNTRY	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
NORTH AFRICA												
EGYPT	16.11 (13.9)	9.97 (8.0)	6.23 (4.4)	1.47 (0.8)	4.20 (1.2)	8.61 (2.1)	11.26 (2.0)	17.10 (2.7)	20.29 (2.8)	26.54 (3.6)	36.21 (4.1)	42.48 (4.1)
LIBYA	0.33 (0.3)	0.68 (0.5)	2.15 (1.5)	5.08 (2.6)	4.73 (1.4)	1.17 (0.3)	4.06 (0.7)	18.74 (3.0)	37.36 (5.3)	14.63 (2.0)	5.54 (0.05)	3.64 (0.5)
SUDAN	4.30 (3.7)	6.64 (5.3)	5.09 (3.6)	1.57 (0.8)	1.38 (0.4)	1.09 (0.3)	3.82 (0.7)	3.99 (0.6)	7.20 (1.0)	6.99 (0.9)	9.48 (1.1)	12.54 (1.2)
TUNISIA & OTHERS	0.10	0.11	0.12	0.23	0.24	0.39	0.24	0.25	1.2	--	--	--
EAST AND SOUTH AFRICA												
KENYA	2.80 (2.4)	3.37 (2.7)	2.97 (2.1)	4.93 (2.5)	7.63 (2.2)	6.72 (1.6)	7.51 (1.4)	14.95 (2.4)	21.35 (3.0)	14.56 (2.0)	17.98 (2.1)	13.59 (1.3)
TANZANIA	2.54 (2.1)	1.69 (1.4)	0.98 (0.7)	2.17 (1.1)	4.52 (1.3)	9.38 (2.3)	16.16 (3.1)	24.58 (3.9)	27.36 (3.8)	24.11 (3.3)	16.51 (1.9)	14.95 (1.4)
UGANDA	1.12 (1.0)	2.02 (1.6)	1.03 (0.7)	1.24 (0.6)	3.53 (1.0)	0.98 (0.2)	1.60 (0.3)	9.87 (1.6)	5.16 (0.7)	9.0 (1.3)	13.45 (1.5)	9.31 (0.9)
ZAMBIA	0.73 (0.6)	1.39 (1.1)	1.01 (0.7)	1.08 (0.6)	4.29 (1.2)	3.08 (0.8)	5.82 (1.1)	3.15 (0.5)	3.45 (0.5)	8.39 (1.1)	12.91 (1.5)	13.21 (1.3)
MAURITIUS	0.24 (0.2)	0.20 (0.2)	0.39 (0.3)	0.85 (0.4)	1.98 (0.6)	1.70 (0.4)	3.60 (0.7)	3.97 (0.6)	5.36 (0.7)	4.97 (0.7)	5.73 (0.7)	8.76 (0.8)

(Contd.)

Table 8.14 Contd.

COUNTRY	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
ETHIEPIS	0.46 (0.4)	0.35 (0.3)	0.35 (0.2)	0.49 (0.3)	0.67 (0.2)	0.80 (0.2)	1.23 (0.2)	2.20 (0.4)	3.29 (0.5)	2.23 (0.3)	3.11 (0.4)	3.71 (0.4)
OTHERS	2.84 (2.45)	1.09 (0.87)	0.91 (0.47)	1.22 (0.34)	0.06	0.01	--	2.81 (0.45)	4.03 (0.56)	--	--	--
WEST AND CENTRAL AFRICA												
GHANA	0.32 (0.3)	0.74 (0.6)	0.36 (0.3)	0.59 (0.3)	0.82 (0.2)	0.94 (0.2)	1.16 (0.2)	3.01 (0.5)	2.75 (0.4)	1.40 (0.2)	7.04 (0.8)	3.53 (0.3)
NIGERIA	5.39 (4.7)	5.55 (4.4)	5.02 (3.6)	5.84 (3.0)	13.35 (3.8)	26.74 (6.5)	16.68 (3.0)	17.22 (2.8)	15.15 (2.1)	18.76 (2.5)	35.58 (4.1)	48.39 (4.6)
OTHERS	0.1 (0.09)	0.27 (0.21)	0.18 (0.13)	1.18 (0.60)	1.27 (0.36)	3.45 (0.84)	6.23 (1.13)	2.82 (0.45)	1.58 (0.22)	--	--	--

(Contd.)

Table 8.14 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
NORTH AFRICA												
ALGERIA	--	--	--	--	---	--	--	--	4.00 (0.11)	7.00 (0.13)	18.00 (0.26)	43.00 (0.48
EGYPT	34.31 (3.4)	40.00 (4.0)	36.00 (3.1)	40.00 (4.0)	27.00 (2.3)	23.00 (1.69)	25.00 (1.57)	39.00 (1.65)	44.00 (1.25)	66.00 (1.3)	105.00 (1.5)	178.00 (2.02)
LIBYA	4.96 (0.5)	4.00 (0.4)	8.50 (0.7)	4.00 (0.4)	2.00 (0.2)	2.00 (0.14)	neg.	3.00 (0.12)	2.00 (0.05)	2.00 (0.03)	1.00 (0.01)	6.00 (0.06)
MOROCCO		--	--	--	--	--	--	--	5.00 (0.1)	11.00 (0.2)	21.00 (0.3)	21.00 (0.23)
SUDAN	12.00 (1.2)	--	--	--	--	9.00 (0.6)	15.00 (0.9)	17.00 (0.7)	19.00 (0.5)	19.00 (0.3)	30.00 (0.4)	27.00 (0.30)
TUNISIA & OTHERS			--	--	--	1.00 (0.07)	1.00 (0.06)	2.00 (0.08)	4.00 (0.1)	5.00 (0.09)	5.00 (0.07)	5.00 (0.5)
EAST AND SOUTH AFRICA												
KENYA	11.44 (1.1)	10.50 (1.1)	16.00 (1.4)	12.00 (1.2)	13.00 (1.1)	22.00 (1.6)	31.00 (1.9)	46.00 (1.9)	44.00 (1.25)	47.00 (1.13)	52.00 (0.76)	79.00 (0.89)
TANZANIA	13.86 (1.4)	12.75 (1.3)	5.00 (0.4)	7.00 (0.7)	10.00 (1.0)	8.00 (0.5)	15.00 (0.9)	21.00 (0.89)	26.00 (0.7)	57.00 (1.13)	52.00 (0.76)	78.00 (0.88)

(Contd.)

Table 8.14 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
UGANDA	21.23 (2.1)	13.25 (1.3)	5.25 (0.5)	18.00 (1.8)	18.00 (1.6)	10.00 (0.7)	13.00 (0.8)	21.00 (0.89)	15.00 (0.4)	24.00 (0.47)	38.00 (0.5)	50.00 (0.56)
ZAMBIA	12.35 (1.2)	12.50 (1.3)	7.50 (0.7)	7.00 (0.7)	3.00 (0.3)	3.00 (0.22)	14.00 (0.88)	20.00 (0.85)	24.00 (0.6)	30.00 (0.5)	37.00 (0.5)	15.00 (0.17)
MAURITIUS	2.24 (0.2)	5.00 (0.5)	6.25 (0.5)	8.00 (0.8)	10.00 (0.9)	10.00 (0.73)	5.00 (0.31)	4.00 (0.17)	19.00 (0.54)	24.00 (0.4)	25.00 (0.3)	32.00 (0.36)
BOTSWANA	--	--		--	--	--	--	--	--	5.00 (0.09)	--	2.00 (0.02)
MADAGASKAR	--	--	--	--	--	--	--	--	--	4.00 (0.1)	3.00 (0.04)	4.00 (0.04)
MALAVI	--	--	--	--	--	--	--	--	--	11.00 (0.2)	12.00 (0.17)	22.00 (0.25)
MOZAMBIQUE	--	--	--	--	--	--	--	--	--	6.00 (0.1)	12.00 (0.1)	15.00 (0.17)
ETHIEPIS	1.60 (0.2)	3.00 (0.3)	3.25 (0.3)	3.00 (0.3)	2.00 (0.2)	2.00 (0.1)	6.00 (0.3)	--	--	5.00 (0.09)	8.00 (0.1)	34.00 (0.38)
SOUTH AFRICA	--	--	--	--	--	--	--	--	--	--	--	10.00 (0.11)
OTHERS	--	--		--	--	7.00 (0.5)	7.00 (0.4)	--	44.00 (1.25)	3.00 (0.05)	6.00 (0.08)	11.00 (0.12)

(Contd.)

Table 8.14 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
WEST AND CENTRAL AFRICA												
GHANA	9.44 (0.9)	9.00 (0.7)	16.00 (1.4)	10.00 (1.0)	3.00 (0.3)	5.00 (0.4)	5.00 (0.3)	9.00 (0.4)	6.00 (0.17)	22.00 (0.43)	28.00 (0.41)	22.00 (0.25)
NIGERIA	40.00 (4.0)	29.25 (2.9)	24.50 (2.1)	20.00 (2.0)	18.00 (1.6)	26.00 (1.9)	44.00 (2.76)	50.00 (2.12)	71.00 (2.02)	135.00 (2.67)	216.00 (3.18)	165.00 (1.8)
ANGOLA	--	--	--		--	--	--	--		1.00 (0.01)	9.00 (0.13)	1.00 (0.01)
MALI	--	--	--	--	--	--	--	--	--	4.00 (0.07)	12.00 (0.1)	4.00 (0.04)
ZAIRE	--	--	--	--		--	--	--	--	1.00 (0.01)	2.00 (0.02)	5.00 (0.05)
OTHERS	--	--	--	--		--	--		--	14.00 (0.2)	18.00 (0.26)	32.00 (0.36)

Note   Figures in brackets represent percentage values.
Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta.

labour costs and higher prices of raw materials, they are on the look out for labour intensive and intermediate range of production from other competing sources.

The African countries offer good potential for India's engineering goods which include textile machinery, diesel engines, commercial vehicles, pumping sets, etc. The percentage shares of exports of engineering goods to India's African customer countries at the end of 1993-94 are as follows (See Table 8.14): Ghana Rs.22 crore (0.25 per cent), Ethiopia Rs.34 crore (0.38 per cent), Libya Rs.6 crore (0.06 per cent) and Sudan Rs.27 crore (0.30 per cent). Export opportunities in selected African countries are given in Appendix IV.

The details of some of the countries of the region are given below:

1. Egypt

The Egyptian civilisation goes back to about 5-6 thousand years of recorded history. The pyramids, just outside Cairo, speak of the great engineering skill and technical advance of the Egyptian people and excellence attained by them in mummification. India has age old trade links with Egypt and commerce flowed through the phoenicians and later, the Arabs.

Egypt is the foremost buyer of India's eggineering items among the African customers. During 1970-71 engineering goods exports to this country amounted to Rs.16.11 crore, which formed 13.9 per cent of the total exports of Egypt. Exports declined sharply in the subsequent years and touched the lowest point of Rs.8.61 crore (2.1 per cent) at the end of 1975-76 (Jain, 1984). Thereafter, the value increased from Rs.17.1 crore in 1977-78 to about Rs.66 crore in 1991-92. However, the percentage share had fallen when compared to the percentage shares in the beginning of 1970. Notwithstanding, Egypt occupies eighth position with reference to India's engineering exports at the end of 1990-91 (See Table 8.15).

2. Nigeria

Nigeria imports mainly two items from India viz., (1) engineering goods, and (2) cotton yarn. In the year 1975-76, Nigeria's imports from India accounted Rs.37.02 crore, out of which the share of engineering goods was as high as 72 per cent (Jain, 1984). Nigeria has the highest percentage share of engineering goods export from India to

Table 8.15: Position of Engineering Goods in India's Overall Exports to Egypt

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1970-71	90.00	16.11	13.90
1975-76	410.00	8.61	2.10
1980-81	86.00	36.21	42.10
1987-88	79.00	23.00	29.11
1988-89	86.00	25.00	29.06
1989-90	140.00	39.00	27.85
1990-91	177.00	44.00	24.85
1991-92	199.78	66.00	33.16
1992-93	331.00	105.00	31.72
1993-94	380.00	178.00	46.84

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

African countries. It comes next to Egypt in the order for India's engineering exports with 3.18 per cent (Rs.216 crore) at the end of 1992-93.

3. Kenya

During the year 1980-81, the share of engineering goods exports to Kenya was 54.4 per cent. This share rose to 62.85 per cent with an amount of Rs.22 crore against a total export of Rs.35 crore in the year 1987-88. During 1990-91 the share of engineering exports showed an increase of 67.69 per cent against the total exports worth Rs.65 crore. But the year 1991-92 saw a decline in this share to 55.35 per cent out of a total export of Rs.203 crore. This decline was the result of the problems in balance of payments faced by Kenya (See Table 8.16).

4. Tanzania

In the year 1980-81, India exported engineering goods worth Rs.16.51 crore which was 71.70 per cent of its total exports to Tanzania. In the year 1991-92, though the total Indian exports to Tanzania rose to Rs.118 crore, the share of engineering goods showed a downward trend with only 44 per cent which amounted to Rs.52 crore only (See Table 8.17). This is due to the imbalance in their foreign

Table 8.16: Position of Engineering Goods in India's Overall Exports to Kenya

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	33.00	17.98	54.40
1987-88	35.00	22.00	62.85
1988-89	51.00	31.00	60.78
1989-90	75.00	46.00	61.33
1990-91	65.00	44.00	67.69
1991-92	103.00	57.00	55.33
1992-93	167.00	52.00	31.14
1993-94	222.00	79.00	35.58

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

Table 8.17: Position of Engineering Goods in India's Overall Exports to Tanzania

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	23.00	16.51	71.70
1987-88	22.00	8.00	36.36
1988-89	31.00	15.00	48.38
1989-90	39.00	21.00	53.84
1990-91	53.00	26.00	49.05
1991-92	118.42	57.00	48.13
1992-93	203.00	52.00	25.61
1993-94	200.00	78.00	39.00

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

Table 8.18: Position of Engineering Goods in India's Overall Exports to Zambia

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	30.00	12.91	43.03
1987-88	5.00	3.00	60.00
1988-89	26.00	14.00	53.84
1989-90	37.00	20.00	54.05
1990-91	40.00	24.00	60.00
1991-92	67.18	30.00	44.77
1992-93	81.00	37.00	45.67
1993-94	89.00	15.00	16.85

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

trade and Tanzania reduced their imports of sophisticated machineries from India and other countries.

5. Zambia

The percentage of engineering goods exports to Zambia was 44 per cent of the total exports in the year 1977-78 (Jain, 1984), while during 1976-77, the percentage contribution rose upto 62 per cent. But India's performance was not at all interesting in the following years and a declining trend persisted which resulted in the fall of the percentage growth rate to 44.77 per cent in 1991-92. Zambia, being an underdeveloped country, India could have boosted her exports by following a diversified export policy which she is not able to do all these years (See Table 8.18).

Zambia is trying to improve its infrastructure and other facilities. It offers a market for India's engineering goods and consumer goods. We should increase our banking, insurance and shipping presence in Zambia where, a sizeable Indian ethnic population is domiciled.

IV. North America

1. United States of America (USA)

In the North American region there are two main

Table 8.19: Position of Engineering Goods in India's Overall Exports to USA

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	743.00	70.31	9.46
1982-83	927.00	51.61	5.56
1983-84	1464.00	80.00	5.46
1984-85	1766.00	125.00	7.07
1985-86	1994.00	100.00	5.01
1986-87	2357.00	122.00	5.18
1987-88	2920.00	111.00	3.80
1988-89	3728.00	203.00	5.44
1989-90	4474.00	275.00	6.14
1990-91	4796.00	346.00	7.21
1991-92	7200.91	495.00	6.87
1992-93	10183.00	658.00	6.46
1993-94	12542.00	908.00	7.24

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

countries - the USA and Canada. The United States occupies an important position in so far as India's export trade is concerned. But it is a matter of great grief that we have hardly touched the potential points of the US market in terms of engineering goods. Prior to 1965 the contribution of engineering goods was negligible in India's overall export to the USA. In the year 1965-66, the contribution of engineering goods was as low as Rs.86.8 lakh (0.37 per cent of total exports) (Jain, 1984).

In the year 1975-76, India exported engineering goods was worth Rs.15.54 crore, which accounted to three per cent of India's overall export to USA. Total export volume to the USA in that year amounted to Rs.505.39 crore. In the year 1980-81 the contribution of engineering goods rose to Rs.70.31 crore out of a total export of Rs.743 crore. During 1991-92, the value of engineering goods exports increased to Rs.495 crore which accounted for 6.87 per cent of India's overall export to USA (Rs.7,199 crore) (See Table 8.19).

"India is very far behind countries like Korea, Taiwan, Hong Kong and Singapore in the export of "Manufactures" to US, although she has already joined the

Table 8.20: Indian Engineering Goods Exports to USA and Canada

(Rs. in crore)

Year	USA		Canada	
(1)	(2)	(3)	(4)	(5)
1970-71	4.24	(3.7)	0.51	(0.4)
1971-72	3.72	(3.0)	0.30	(0.2)
1972-73	8.26	(5.9)	0.51	(0.4)
1973-74	10.31	(5.3)	0.83	(0.4)
1974-75	22.95	(6.6)	2.99	(0.9)
1975-76	15.54	(3.8)	3.15	(0.8)
1976-77	27.40	(5.0)	3.76	(0.7)
1977-78	36.13	(5.8)	3.63	(0.6)
1978-79	50.86	(7.1)	4.39	(0.6)
1979-80	67.41	(9.2)	5.88	(0.8)
1980-81	70.30	(8.0)	4.77	(0.5)
1981-82	61.48	(5.9)	6.01	(0.6)
1982-83	51.61	(5.1)	5.02	(0.5)
1983-84	80.00	(8.0)	7.00	(0.7)
1984-85	125.00	(10.9)	7.50	(0.7)
1985-86	100.00	(10.0)	6.50	(0.7)
1986-87	122.00	(10.6)	6.00	(0.5)
1987-88	111.00	(8.19)	7.00	(0.5)
1988-89	203.00	(12.7)	12.00	(0.7)

(Contd.)

Table 8.20 Contd.

(1)	(2)	(3)	(4)	(5)
1989-90	275.00	(11.70)	12.00	(0.5)
1990-91	346.00	(9.80)	19.00	(0.5)
1991-92	495.00	(9.80)	25.00	(0.4)
1992-93	658.00	(9.70)	32.00	(0.4)
1993-94	908.00	(10.32)	57.00	(0.8)

Note Figures in brackets represent percentage values.
Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta.

rank of newly industrialised countries (NIC), albiet late. Now that these 'first wave' NICs are turning to other high-tech products for their targetted exports. India can certainly attempt to fill the gap created by them" (Trivedi, 1990). As the rising American labour costs are compelling them to move to cheaper sources of supply, we can offer them large quantities at stipulated deliveries of high quality goods at competitive prices. Engineering goods exports to USA and Canada is given in Table 8.20.

2. Canada

Canada has been a major importer of traditional Indian items like cotton, jute goods and textiles. In the field of engineering goods Canada offers a very good scope for various articles. In the year 1965-66, the contribution of engineering goods to total export to Canada was less than 0.2 per cent which was valued at Rs.3.15 crore (Jain, 1984).

In the year 1980-81, it further rose upto 7.69 per cent while the total export to Canada were valued at Rs.62 crore. From 1987-88 to 1991-92 we can see a different trend in the engineering goods export to Canada. During 1987-88 the share was 4.21 per cent while it increased to

Table 8.21: Position of Engineering Goods in India's Overall Exports to Canada

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	62.00	4.77	7.69
1982-83	58.00	5.02	8.65
1983-84	93.00	7.00	7.52
1984-85	131.00	7.50	5.72
1985-86	132.00	6.50	4.92
1986-87	149.00	6.00	4.03
1987-88	166.00	7.00	4.21
1988-89	197.00	12.00	6.09
1989-90	264.00	12.00	4.54
1990-91	281.00	19.00	6.76
1991-92	465.03	25.00	5.37
1992-93	554.00	32.00	5.78
1993-94	715.00	57.00	7.97

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

6.09 in the next year. But India could not maintain the rise and during 1989-90 it again decreased to 4.54 per cent. The years that followed also showed the same feature with rise of 6.76 per cent and a fall of 5.37 per cent during 1990-91 and 1991-92 respectively (See Table 8.21).

Our share in the Canadian imports, which has been improving during last couple of years, can be substantially increased if adequate efforts are made to take part in the Toronto trade fair, which is held every year and also at various other exhibitions and trade fairs in other Canadian cities. Export opportunities in USA and Canada is given in Appendix V.

V. South America

This region has a number of small countries and the majority of the countries are going through the initial phase of industrialisation. India can look forward in the field of export of engineering goods to Mexico, Panama, Costa Rica, Brazil, Argentina, Chile, Colombia, Peru, Venezuela, Equador and Carrebean Islands.

Chile, Argentina and Brazil are good markets for Indian engineering goods. The contribution of engineering

Table 8.22: Engineering Goods Exports to South-Central America and Some Other Developing Countries - Country-wise Markets: 1991-92 to 1993-94.

(Rs. in crore)

Country	1991-92		1992-93		1993-94	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Argentina	12.00	(0.23)	28.00	(0.40)	51.00	(0.50)
Brazil	8.00	(0.15)	14.00	(0.20)	33.00	(0.37)
Chile	9.00	(0.17)	15.00	(0.22)	15.00	(0.17)
Mexico	26.00	(0.51)	62.00	(0.91)	60.00	(0.68)
Venezuela	6.00	(0.10)	12.00	(0.17)	14.00	(0.15)
Panama	2.00	(0.03)	7.00	(0.10)	13.00	(0.14)
Paragua	3.00	(0.05)	4.00	(0.05)	10.00	(0.11)
Peru	5.00	(0.09)	6.00	(0.08)	6.00	(0.06)
Uruguay	1.00	(0.01)	6.00	(0.88)	9.00	(0.10)
Columbia	8.00	(0.15)	9.00	(0.13)	20.00	(0.22)
Others	4.00	(0.07)	7.00	(0.10)	9.00	(0.10)

(Contd.)

Table 8.22 Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cyprus	11.00	(0.20)	55.00	(0.81)	5.00	(0.05)
Malta	6.00	(0.11)	14.00	(0.20)	8.00	(0.09)
Turkey	22.00	(0.43)	40.00	(0.58)	65.00	(0.73)
Carreabean Islands	5.00	(0.09)	5.00	(0.07)	9.00	(0.10)
Others	1.00	(0.01)	1.00	(0.01)	8.00	(0.09)

Note Data to these countries before 1990 were negligible.
Figures in brackets represent percentage values.

Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta.

goods to total exports to these countries is also increasing. Engineering goods exports to Central South America and other developing countries is given in Table 8.22.

One of the major constraints in developing closer trade ties with this region has been the absence of regular shipping services from India. Very little of India's economic growth and development and its ability to offer turnkey projects and participate effectively in many governmmnt tenders and development projects is known in these countries.

VI. Australia and New Zealand

1. Australia

India has been a large exporter of jute goods, tea and textiles to Australia for many years. In recent years efforts have been made to enlarge and diversify India's exports to the fields of leather goods, readymade garments, made up textiles, sports goods and engineering goods.

So far as the export of engineering goods is concerned, India has been able to tap the market to a limited extent only. In the year 1960-61, the total Indian

Table 8.23: Position of Engineering Goods in India's Overall Exports to Australia and New Zealand

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1960-61	46.70	0.07	0.01
1970-71	30.40	2.07	6.80
1975-76	60.52	5.91	9.80
1976-77	77.68	6.99	8.90
1977-78	96.63	9.44	9.85
1980-81	92.00	9.68	10.52
1982-83	94.00	9.84	10.46
1983-84	98.00	7.00	7.14
1984-85	138.00	9.00	6.52
1985-86	125.00	12.00	9.60
1986-87	147.00	16.00	10.88
1987-88	180.00	17.00*	9.44
1988-89	197.00	30.00*	15.22
1989-90	264.00	40.00*	15.15
1990-91	281.00	40.00*	14.23
1991-92	558.83	60.00*	10.90
1992-93	736.00*	83.00	11.28
1993-94	875.00	130.00	14.85

* including New Zealand

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

exports to Australia were valued at Rs.46.7 crore, out of which the share of engineering goods was only 0.07 crore (0.01 per cent). In the year 1975-76, the percentage contribution of engineering goods to over all exports to Australia was 9.8 per cent which was valued at Rs.5.91 crore. During 1985-86, the contribution of engineering goods amounted to Rs.12 crore (10 per cent), while the overall export to Australia in that year amounted to Rs.125 crore. Australia's contribution increased to 12.9 per cent during 1991-92 with an amount of Rs.60 crore out of a total export of Rs.465 crore(See Table 8.23).

Quality is very important in the Australian market and also delivery and packaging. The Australians are affluent enough to pick and choose from the best sources and unless our consumer goods can conform to take exacting wwrld standards it may not be possible to make a real breakthrough. For engineering goods there is considerable potential and the Western Australia region offers a vast untapped market. India's Engineering goods exports to Australia and New Zealand is given in Table 8.24.

2. New Zealand

Cashew kernels, castor-oil, chemicals, sports goods, marine products, spices and pickles, textiles, fancy

Table 8.24: Indian Engineering Goods Exports to Australia and New Zealand

(Rs. in crore)

Year	Australia		New Zealand	
1970-71	1.64	(1.4)	0.42	(0.4)
1971-72	1.80	(1.4)	1.44	(1.1)
1972-73	1.96	(1.4)	0.43	(0.3)
1973-74	2.12	(1.1)	1.46	(0.8)
1974-75	6.26	(1.8)	2.10	(0.6)
1975-76	4.00	(1.0)	1.92	(0.5)
1976-77	5.60	(1.0)	1.39	(0.3)
1977-78	8.33	(1.3)	1.11	(0.2)
1978-79	9.64	(1.3)	0.80	(0.1)
1979-80	10.45	(1.4)	3.58	(0.5)
1980-81	9.68	(1.1)	2.69	(0.3)
1981-82	12.76	(1.2)	4.80	(0.5)
1982-83	9.84	(1.0)	1.39	(0.1)
1983-84	7.00	(0.7)	5.00	(0.5)
1984-85	9.00	(0.8)	6.00	(0.5)
1985-86	12.00	(1.2)	3.00	(0.3)
1986-87	16.00	(1.4)	2.00	(0.2)
1987-88	17.00	(1.2)*	--	--
1988-89	30.00	(1.8)*	--	--
1989-90	40.00	(1.7)*	--	--
1990-91	40.00	(1.1)*	--	--
1991-92	60.00	(0.8)*	--	--
1992-93	83.00	(1.2)*	--	--
1993-94	130.00	(1.4)*	--	--

*including New Zealand. Figures in brackets represent percentage values.

Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta.

leather goods and engineering goods find a good scope in the markets of New Zealand. The export trade volume of India with New Zealand is not high. From 1975 to 1979, it ranged between Rs.12 to 15 crore and so is the case with our engineering goods. In the year 1975-76 the contribution of engineering goods exports to overall exports to New Zealand was 14 per cent, the export earnings of which was only Rs.1.92 crore, out of a total export of Rs.12.87 crore.

New Zealand has only a few large manufacturing units on account of its relatively small population and is much more foreign-trade oriented. The long term prospects for Indian exports to these markets are bright.

VII. **West Europe - European Economic Community** (EEC)

In recent years, a number of policy initiatives and incentives have been introduced in an effort to improve India's export performance. Success of these efforts is indicated by the encouraging export growth recorded in the past few years. The new initiatives emphasise the importance of a selective approach to export promotion focussed on "thrust products" and "thrust markets". Since bulk of India's exports are destined to the developed country markets, the performance of exports in these markets will largely determine the overall export performance of the country.

EEC countries offer long term and large markets for imports for a variety of manufactured products, comprising a wide technology spectrum. EEC countries also rank among the leading importers of the world. Thus, the trade orientation of these countries is significant as seen in the fairly large share of trade in the range of 15 to 52 per cent of GDP for most of these countries.

EEC's prominance as a trading area is relevant to India's foreign trade. EEC accounted for 19 per cent of India's global exports. Nearly 87 per cent of India's trade with Europe is concentrated in EEC countries. Thus, EEC occupies a pre-eminent position as a trading partner in India's international trading relationship. However, India's share in EEC's total imports is estimated to be 0.33 per cent. Therefore, scope exists to increase this market share further.

The EEC is a force to reckon with in the world's economic scene. In the opinion of Paul Hentry Speak, the

Table 8.25: Position of Engineering Goods in India's Overall Exports to EEC

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1965-66	321.23	2.65	0.82
1969-70	273.40	8.60	3.14
1970-71	278.70	9.17	3.29
1975-76	854.20	34.02	3.98
1976-77	1395.50	57.48	4.11
1977-78	1392.14	55.68	3.99
1987-88	4046.00	116.00	2.86
1988-89	5109.00	230.00	4.50
1989-90	7122.00	312.00	4.38
1990-91	8951.00	415.00	4.64
1991-92	11898.96	770.00	6.47
1992-93	15196.00	1040.00	6.84
1993-94	18182.00	1165.00	6.40

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

former Foreign Minister of Belgium, "The EEC has become the world's strongest commercial unit, even stronger than USA and USSR". The export trade of India is growing by leaps and bounds with EEC. In the year 1965-66, India's export to EEC amounted to Rs.321.23 crore, in which the share of engineering goods was 0.82 per cent. A real breakthrough came in the year 1991-92 when there was a tremendous increase in India's total as well as engineering goods exports, which amounted to Rs.11,858 and Rs.700 crore respectively and the contribution of engineering goods to total export was 6.47 per cent (See Tables 8.25 and 8.26).

As Europe gets unified, there is bound to be some industrial restructuring. "India should attempt to take advantage of it as best as she can apart from the main group of conventional commodities, that India is exporting to these countries at present (i.e. apparel, floor coverings, cotton fabrics, pearls etc.). India has a chance to push up exports of engineering items" (Trivedi, 1990).

The then EEC President, on the occasion of his visit to India, rightly observed, "India's current export to the EEC can be increased substantially if Indian

TABLE 8.26: INDIAN ENGINEERING GOODS EXPORTS TO EUROPE - COUNTRY-WISE MARKETS

(Rs. in crore)

COUNTRY	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
WEST EUROPE												
BELGIUM & LUXUMBERG	0.23 (0.2)	0.14 (0.1)	0.15 (0.1)	0.46 (0.2)	0.81 (0.2)	1.17 (0.3)	1.00 (0.2)	1.03 (0.2)	1.92 (0.3)	1.54 (0.2)	1.84 (0.2)	0.71 (0.1)
FRANCE	0.24 (0.2)	0.65 (0.7)	0.71 (0.5)	0.99 (0.5)	2.20 (0.6)	3.03 (0.7)	4.90 (0.9)	5.67 (0.9)	5.50 (0.8)	7.25 (1.0)	10.87 (1.2)	7.81 (0.7)
GERMANY	3.13 (2.7)	3.42 (2.7)	3.34 (2.4)	7.00 (3.6)	10.25 (2.9)	11.97 (2.9)	18.16 (3.3)	21.08 (3.4)	23.14 (3.2)	23.84 (3.2)	34.51 (3.9)	19.42 (1.9)
ITALY	0.26 (0.2)	0.33 (0.3)	0.28 (0.2)	0.73 (0.4)	1.11 (0.3)	2.07 (0.5)	2.76 (0.5)	2.99 (0.5)	3.13 (0.4)	5.08 (0.7)	7.18 (0.8)	5.41 (0.5)
HOLLAND	0.96 (0.8)	1.06 (0.8)	0.93 (0.7)	1.08 (0.6)	1.91 (0.5)	3.04 (0.7)	12.27 (2.2)	4.80 (0.8)	4.75 (0.7)	4.61 (0.6)	5.32 (0.6)	5.00 (0.5)
UK	4.09 (3.5)	4.23 (3.4)	4.45 (3.2)	9.20 (4.8)	12.82 (3.7)	12.38 (3.0)	16.98 (3.1)	19.17 (3.1)	30.42 (4.2)	33.74 (4.6)	25.72 (2.9)	30.61 (2.9)
GREECE	0.36 (0.3)	0.40 (0.3)	0.31 (0.2)	0.61 (0.3)	0.67 (0.2)	1.09 (0.3)	1.57 (0.3)	1.77 (0.3)	2.26 (0.3)	2.94 (0.4)	2.54 (0.3)	2.76 (0.3)
SWEDEN	0.46 (0.4)	0.61 (0.5)	0.57 (0.4)	0.65 (0.3)	0.83 (0.2)	1.22 (0.3)	2.57 (0.5)	1.79 (0.3)	3.04 (0.4)	3.36 (0.6)	1.78 (0.2)	2.02 (0.2)
SWITZERLAND	0.08 (0.1)	0.18 (0.1)	0.16 (0.1)	0.23 (0.1)	0.48 (0.1)	0.37 (0.1)	1.25 (0.2)	13.23 (2.1)	18.82 (2.6)	1.91 (0.3)	1.67 (0.2)	1.79 (0.2)

(Contd.)

Table 8.26 Contd.

COUNTRY	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
EAST EUROPE												
Erstwhile USSR	2.33 (2.0)	4.90 (3.9)	7.33 (5.2)	8.13 (4.2)	10.95 (3.1)	19.28 (4.7)	27.37 (5.0)	28.73 (4.6)	28.36 (4.0)	30.93 (4.2)	65.18 (7.5)	123.13 (11.8)
HUNGARY	1.50 (1.3)	1.68 (1.3)	0.21 (0.1)	0.20 (0.1)	1.15 (0.3)	1.23 (0.3)	1.74 (0.3)	1.65 (0.3)	2.83 (0.4)	1.29 (0.2)	1.94 (0.2)	1.84 (0.2)
ROMANIA	0.07 (0.1)	0.18 (0.1)	0.12 (0.1)	0.02 (0.0)	0.30 (0.1)	0.22 (0.1)	0.42 (0.0)	0.26 (0.0)	0.23 (0.03)	0.58 (0.1)	4.13 (0.5)	4.67 (0.4)
YUGOSLAVIA	6.06 (5.2)	2.78 (2.2)	2.80 (2.0)	3.89 (2.0)	6.19 (1.8)	14.16 (3.5)	6.87 (1.2)	7.49 (1.2)	10.44 (1.5)	4.16 (0.6)	3.53 (0.6)	4.51 (0.4)

(Contd.)

Table 8.26 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
WEST EUROPE												
BELGIUM & LUXUMBERG	--	--	--	--	--	--	--	35.00 (1.4)	10.00 (0.28)	31.00 (0.6)	56.00 (0.8)	46.00 (0.5)
DENMARK		--	--	--	--	--		--	--	8.00 (0.1)	13.00 (0.1)	23.00 (0.26)
FRANCE	7.82 (0.8)	8.00 (0.9)	11.00 (1.0)	10.00 (1.0)	8.00 (0.7)	15.00 (1.10)	30.00 (1.8)	40.00 (1.7)	39.00 (1.1)	54.00 (1.07)	76.00 (1.1)	116.00 (1.3)
GERMANY	19.04 (1.9)	22.00 (2.2)	28.00 (2.4)	20.00 (2.0)	30.00 (2.6)	30.00 (2.2)	45.00 (2.83)	57.00 (2.4)	101.00 (2.8)	186.00 (3.7)	230.00 (3.3)	256.00 (2.3)
ITALY	3.95 (0.4)	4.50 (0.5)	4.00 (0.3)	5.00 (0.5)	8.00 (0.7)	11.00 (0.8)	20.00 (1.2)	21.00 (0.8)	28.00 (0.8)	160.00 (3.1)	189.00 (2.7)	88.00 (1.0)
HOLLAND	5.85 (0.6)	5.00 (0.5)	6.75 (0.6)	4.00 (0.4)	8.00 (0.7)		--	--	--	--	--	--
UK	25.89 (2.6)	35.00 (3.5)	40.00 (3.5)	30.00 (3.0)	26.00 (2.3)	45.00 (3.3)	85.00 (5.3)	118.00 (5.0)	169.00 (4.8)	245.00 (4.8)	340.00 (5.0)	422.00 (4.7)
GREECE	--	--		--	--	--	--	--	--	9.00 (0.1)	17.00 (0.2)	31.00 (0.35)
AUSTRIA	--	--	--	--	--	--	--		--	3.00 (0.05)	3.00 (0.04)	6.00 (0.06)

(Contd.)

Table 8.26 Contd.

COUNTRY	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
FINLAND	--	--	--	--	--	--	--	--	--	84.00 (1.6)	63.00 (0.9)	7.00 (0.07)
NORWAY	--	--	--	--	--	--	--	--	--	--	--	2.00 (0.02)
SWEDEN	--	--	--	--	--		--	--	--	5.00 (0.09)	7.00 (0.10)	10.00 (0.1)
SWITZERLAND	--	--	--	--	--	--	--	--	--	38.00 (0.7)	52.00 (0.7)	35.00 (0.3)
EAST EUROPE												
Erstwhile USSR	210.5 (20.8)	135.00 (13.5)	185.00 (16.1)	200.00 (20.00)	330.00 (28.7)	319.00 (23.5)	347.00 (21.8)	550.00 (23.40)	840.00 (24.0)	591.00 (10.3)	185.00 (2.7)	--
ROMANIA	--	--		--	--		--	--		12.00 (0.2)	16.00 (0.2)	--
YUGOSLAVIA	--	--	--	--	--	--		--	34.00 (0.9)	9.00 (0.1)	--	

Note Figures in brackets represent percentage values.
Source: Compiled from Engineering Export Promotion Council Data Sheet, various issues, Calcutta.

industry is able to adhere to delivery schedules and also improve in respect of techniques of adaptation to suit the sophisticated requirements of consumers" (Singh & Singh, 1990). Export opportunities in selected European countries are given in Appendix VI, VII and VIII.

The details of some of the countries of the region are given below:

1. United Kingdom

India's engineering exports to the United Kingdom continuously rose during eighties. In the year 1970-71, India exported engineering goods to the UK worth Rs.4.20 crore. In the year 1975-76, exports of engineering goods amounted to Rs.12.38 crore, which was only three per cent of the total Indian exports to the UK. In the year 1980-81 there was an increase upto 6.5 per cent in the share of engineering goods exports to total exports to the UK. In the year 1991-92 again there was an increase in this share and it rose to 8.73 per cent which was valued at Rs.245 crore, while the total export to the UK, this year was Rs.2,804 crore (See Table 8.27).

2. France

India's engineering exports to France has not

Table 8.27: Position of Engineering Goods in India's Overall Exports to United Kingdom

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	395.00	25.72	6.50
1982-83	421.00	25.89	6.10
1983-84	492.00	35.00	7.10
1984-85	613.00	40.00	6.50
1985-86	538.00	30.00	5.50
1986-87	736.00	26.00	3.50
1987-88	1015.00	45.00	4.43
1988-89	1153.00	85.00	7.30
1989-90	1602.00	118.00	7.30
1990-91	2127.00	169.00	7.90
1991-92	2806.00	245.00	8.73
1992-93	3514.00	340.00	9.67
1993-94	4326.00	422.00	9.75

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

Table 8.28: Share of Engineering Goods in India's Overall Exports to France

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	147.00	10.87	7.39
1982-83	146.00	7.82	5.35
1983-84	160.00	8.00	5.00
1984-85	191.00	11.00	5.75
1985-86	200.00	10.00	5.00
1986-87	274.00	8.00	2.90
1987-88	379.00	15.00	3.95
1988-89	427.00	30.00	7.02
1989-90	638.00	40.00	6.26
1990-91	766.00	39.00	5.09
1991-92	1049.00	54.00	5.18
1992-93	1366.00	76.00	5.56
1993-94	1582.00	116.00	7.33

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

shown a promising picture upto 1991-92. During 1980-81 it was 7.39 per cent of the total exports to France. The years that followed marked a fall in this percentage and it touched the lowest point of 2.9 per cent in 1986-87. In that year the total exports was Rs.274 crore in which the engineering exports amounted to only Rs.8 crore. It again rose to 3.95 and 7.02 per cent during 1987-88 and 1988-89 respectively. But again it went down in the later years and though the total exports increased upto Rs.1,043 crore during 1991-92, the share of engineering goods exports to total exports was only 5.18 per cent which amounts to Rs.54 crore only (See Table 8.28). France is a very good market for our engineering goods like Tractors and their parts, three-speed bycycles which can be folded and re-assembled, automotive parts etc. But India is not able to exploit the full potentialities of these exports to France. Active efforts should be made from the part of the government and also from the exporters' side to increase the amount of engineering exports as well as total exports to France.

3. Italy

After a fall in 1982-83 to 2.82 per cent from a high of 4.72 per cent in 1980-81, Italy was showing a consistency in engineering exports from India till 1991-92.

Table 8.29: Share of Engineering Goods in India's Overall Exports to Italy

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	152.00	7.18	4.72
1982-83	140.00	3.95	2.82
1983-84	164.00	4.50	2.74
1984-85	213.00	4.00	1.87
1985-86	206.00	5.00	2.42
1986-87	320.00	8.00	2.50
1987-88	498.00	11.00	2.20
1988-89	540.00	20.00	3.70
1989-90	762.00	21.00	2.75
1990-91	1001.00	28.00	2.79
1991-92	1430.00	160.00	11.18
1992-93	1802.00	189.00	10.49
1993-94	1895.00	88.00	4.64

Source: Compiled from
1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

In 1991-92 a dramatic rise is seen in the figures. From a low of 2.79 per cent in 1990-91 it suddenly went upto 11.18 per cent in 1991-92. During these years the total exports were Rs.1,001 crore and Rs.1,431 crore and the exports of engineering goods were valued at Rs.28 crore and Rs.160 crore respectively. The bleakest performance by India was during 1994-95. In that year the share of engineering exports to a total export of Rs.213 crore was 1.87 per cent which amounted to only Rs.4 crore. India was not able to improve her stand in the later years upto 1991-92. The rise in the percentage of engineering exports during 1991-92 was an aftermath of the Gulf war of 1990-91. India was loosing a very good market for the time being for her exports and to compensate for this loss, India tried to boost her exports to the European countries which resulted in such a rise in the percentage share of engineering export to 11.18 per cent. The total exports during the year was Rs.1,431crore and the value of engineering goods exports was Rs.160crore (See Table 8.29). Also the policy changes effected by the Government of India, the policy of liberalisation, the use of sophisticated technology in production and the proper implementation of time schedule in joint-ventures abroad were the reasons for this rise in engineering exports.

Table 8.30: Share of Engineering Goods in India's Overall Exports to Germany

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1980-81	385.00	34.51	8.96
1982-83	339.00	19.04	5.61
1983-84	407.00	22.00	5.40
1984-85	488.00	28.00	5.73
1985-86	507.00	20.00	3.94
1986-87	739.00	30.00	4.05
1987-88	1171.00	30.00	2.56
1988-89	1419.00	45.00	3.17
1989-90	1994.00	57.00	2.85
1990-91	2549.00	101.00	3.96
1991-92	3131.00	186.00	5.99
1992-93	4133.00	230.00	5.56
1993-94	4828.00	256.00	5.30

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

4. West Germany

The rising trend in India's engineering exports to West Germany during seventies and eighties is evident until 1980-81 when the export figure reached the highest Rs.34.5 crore commanding 3.9 per cent in India's total engineering exports. In the year 1977-78, India's total exports to West Germany amounted to Rs.3,105 crore in which the share of engineering goods was Rs.186 crore (See Table 8.30).

After the unification, Germany is Europe's richest market and affords the best potential for Indian products, in a large variety of engineering items. If India could establish a bonded warehouse in a central place like Hamburg or Amsterdam and stock many of the items required by large engineering and automotive plants in Germany and the big departmental stores, there is no reason why our exports cannot be substantially increased.

VIII. East Europe

India's export trade with the East European countries has witnessed a spectacular expansion during the last 40 years. India's exports rose from Rs.14 crore in 1950-51 to Rs.362.43 crore in 1970-71 and further to Rs.1,401.90 crore in the year 1980-81. So far as the position of engineering goods in the total export is concerned, due to high degree of advancement in the field of technology and mutual co-operation amongst the socialist countries (now most of the countries are following the democratic system), India could not augment her export of engineering goods. Let us have a picture of USSR of this region.

The USSR was the largest trading partner of India and the largest customer for the Indian exports. Although USSR imported traditional goods from India, like jute manufactures, tea, leather, cashew kernels, spices etc., but after 1970-71, Indian engineering goods were also gaining good ground. In the year 1970-71, the share of engineering goods to the total exports was barely 1.0 per cent while this share rose upto 15.98 per cent in 1990-91. In the year 1990-91, export of engineering goods to the USSR amounted to Rs.591 crore, which was 14.89 per cent of the total export to USSR (See Table 8.31).

Direction of India's foreign trade has undergone a significant change with the collapse of USSR and some of the East European trading arrangements. The collapse of the Russian market has been a major shock to our export

Table 8.31: Share of Engineering Goods in India's Overall Exports to Erstwhile Soviet Union

(Rs. in crore)

Year	Total Exports	Export of Engineering goods	% Share of Engineering goods to total exports
1956-57	15.50	--	--
1960-61	28.80	0.03	neg.
1965-66	146.50	0.05	neg.
1970-71	209.80	2.33	1.00
1975-76	412.70	19.28	4.00
1976-77	440.37	27.37	6.00
1977-78	650.50	28.74	4.00
1979-80	638.23	30.93	4.80
1980-81	1226.00	65.18	5.31
1982-83	1662.00	210.50	12.60
1983-84	1229.00	135.00	10.98
1984-85	1880.00	185.00	9.80
1985-86	1937.00	200.00	10.32
1986-87	1873.00	330.00	17.61
1987-88	1963.00	319.00	16.25
1988-89	2609.00	347.00	13.30
1989-90	4463.00	550.00	12.32
1990-91	5255.00	840.00	15.98
1991-92	4043.00	591.00	14.89
1992-93	1756.00	185.00	10.53
1993-94	N.A.	N.A.	--

Source: Compiled from

1. Report on Currency and Finance, 1991-92, Reserve Bank of India, Bombay.
2. Engineering Export Promotion Council Data Sheet, various issues, Calcutta.
3. India's Foreign Trade: 1994-95 (1995), Facts For You, Vol.16, No.12, June, p.90.

efforts. However, exporters have demonstrated creditable flexibility and competitiveness in successfully switching exports to the General currency Area and preventing the decline in exports to Russia from affecting the overall export performance.

The data reveal that Indian exports have improved considerably. India had faced many hurdles and setbacks during the past decades, but an overall growth has been attained in recent years. To improve India's exports in general, with special focus to engineering exports we have to adopt many new methods and the current measures of export promotion have to be improved considerably. Political, social and economic reasons have an influence on India's economic development. The experiences of Japan and Taiwan can be considered as examples.

In the percentage level India's exports to he third world and developing countries are quite satisfactory. But the quantum of exports is very minimal. For instance, India could have reached new heights in the exports to Indonesia if we have followed the credit policy which has been adopted by a few developed countries. The credit policy may affect India's short term progress but in the long run Indian economy can be stabilised. Moreover, African countries have good political understanding with Indian government and that can be used as an instrument to boost India's exports.

Japan is influencing the global trade in many ways. India is facing good competition in the field of bicycle exports to Japan and other countries. As the Japanese demand is for bicycles of good quality, they are not willing to import Indian bicycles even though they are cheaper than others. So that if Indian exporters insist on quality rather than quantity of product we can have good hold on the Japanese market within a short time.

Now, many advanced countries are trying to stagnate our exports through invoking 'social clause'. This gives an apprehension to Indian export economy that it may hamper India's progress. Therefore it is high time to consider this issue seriously and to make it clear to the world that such set backs will not affect our exports.

Last but not the least, India's regional-wise trade agreements are now showing positive results. For example, EEC has become a strong economic organisation and now the member countries have more or less adopted a uniform economic policy. Hence, India should concentrate on regional trade and that does not mean reducing trade with other regions.

Growth Rates of Individual Export Markets

To analyse the trends in the direction of engineering exports, attempt is also made to analyse the direction of exports by destination country. 38 countries, 18 from Asia, 11 from Africa, 2 from North America, 4 from West Europe, Australia, New Zealand and erstwhile USSR are selected for this purpose. The exponential growth rates of exports from India to these countries during the period are given in Tables 8.32, 8.33, 8.34, 8.35 and 8.36.

It is noticed from these tables that generally the rates of growth are higher for the advanced countries like Japan, USA, United Kingdom, France, Italy, Germany (FR) and Australia. A snap decision taken by any of the country to restrict imports, or increase tariffs, would drive away the Indian goods from such markets.

The above analysis evidently shows the country-wise diversification taken place during the period under

Table 8.32: Annual Growth Rates of Exports of Engineering Goods to Selected Countries of Asia 1970-71 to 1993-94

Country	1970-71 to 1980-81	R^2	1981-82 to 1993-94	R^2	1970-71 to 1993-94	R^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bangladesh	34.37	0.73 (4.93)	19.85	0.90 (10.12)	17.46	0.79 (9.03)
Nepal	16.95	0.93 (11.45)	27.71*	0.53 (2.37)	--	--
Sri Lanka	23.96	0.83 (6.82)	21.90	0.71 (5.13)	14.28	0.75 (8.21)
Indonesia	28.35	0.89 (8.83)	18.02	0.46 (3.05)	13.43	0.64 (6.29)
Malaysia	21.83	0.82 (6.46)	23.79	0.75 (5.69)	12.64	0.67 (6.74)
Singapore	17.45	0.93 (11.54)	28.29	0.81 (7.06)	16.54	0.83 (10.28)
Thailand	19.69	0.92 (10.19)	25.58	0.72 (5.28)	13.35	0.67 (6.99)
Japan	30.97	0.48 (2.87)	28.21	0.66 (4.63)	26.80	0.81 (9.74)

(Contd...

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bahrain	28.14	0.74 (4.99)	9.67	0.26 (2.01)	12.03	0.60 (5.78)
Iran	14.19	0.87 (7.65)	10.17	0.18 (1.57)	7.00	0.37 (3.57)
Jordan	16.18	0.55 (3.31)	26.85	0.81 (7.01)	14.13	0.72 (7.48)
Iraq	19.87	0.59 (3.58)	-6.35**	0.04 (-0.62)	7.19***	0.15 (1.84)
Kuwait	22.53	0.71 (4.67)	6.23	0.14 (1.32)	7.19	0.38 (3.68)
Oman	35.05	0.79 (5.76)	12.76	0.42 (2.79)	14.81	0.66 (6.58)
Qatar	24.81	0.84 (7.11)	1.61	0.02 (0.43)	8.97	0.54 (5.09)
Saudi Arabia	36.25	0.95 (12.90)	6.37	0.26 (1.98)	13.83	0.69 (7.18)
UAE	33.89	0.72 (4.83)	25.45	0.75 (5.68)	17.97	0.72 (7.69)
YAE	40.96	--	--	--	7.05****	0.26 (2.55)

* 1987-88 to 1993-94   ** 1981-82 to 1990-91
*** 1970-71 to 1990-91   **** 1974-75 to 1993-94

Note: Figures in brackets represent 't' values.

Table 8.33: Average Annual Growth Rates of Exports of Engineering Goods to Selected Countries of Africa: 1970-71 to 1993-94

	1970-71 to 1980-81	R^2	1981-82 to 1993-94	R^2	1970-71 to 1993-94	R^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Egypt	15.82	0.33 (2.12)	9.15	0.38 (2.61)	11.87	0.66 (6.56)
Libya	34.00	0.62 (3.83)	-22.84	(0.12) (-1.25)	-15.46	0.023 (-0.73)
Sudan	7.35	--	--	--	0.61 (0.05)	0.0001
Kenya	21.16	0.90 (9.34)	17.30	0.88 (8.97)	12.16	0.85 (11.06)
Tanzania	24.47	0.77 (5.46)	16.52	0.58 (3.91)	9.91	0.49 (4.67)

(Contd.)

Table 8.33 Contd.

(1)	(2)	(3)	(4)	(5)	(5)	(7)
Uganda	24.18	0.65 (4.00)	10.17	0.45 (2.99)	14.95	0.78 (8.92)
Zambia	25.17	0.81 (6.27)	9.27	0.21 (1.73)	12.82	0.67 (6.69)
Mauritius	36.59	0.90 (9.49)	15.03	0.54 (3.59)	17.01	0.78 (8.72)
Ethiopia	24.81	0.89 (8.92)	-8.67	0.011 (-0.35)	1.88	-0.003 (0.26)
Ghana	25.19	0.79 (5.91)	9.53	0.27 (2.01)	16.86	0.80 (9.44)
Nigeria	17.64	0.72 (4.81)	15.29	-54.00 (3.61)	12.55	0.77 (8.53)

Note: Figures in brackets represent 't' values.

Table 8.34: Annual Growth Rates of Exports of Engineering Goods to USA and Canada

Country	1970-71 to 1980-81	R^2	1981-82 to 1993-94	R^2	1970-71 to 1993-94	R^2
USA	30.69	0.95 (13.41)	22.94	0.94 (13.30)	20.64	0.95 (20.37)
Canada	29.74	0.83 (6.63)	17.89	0.83 (7.38)	16.88	0.86 (11.66)

Note: Figures in brackets represent 't' values.

Table 8.35: Annual Growth Rates of Exports of Engineering Goods to Selected Countries of West Europe: 1970-71 to 1993-94

Country	1970-71 to 1980-81	R^2	1981-82 to 1993-94	R^2	1970-71 to 1993-94	R^2
France	34.61	0.93 (11.08)	23.67	0.90 (10.14)	20.67	0.91 (14.91)
Germany	25.76	0.94 (12.79)	23.53	0.88 (8.99)	15.71	0.86 (11.49)
Italy	35.00	(13.29)	32.95	0.84 (7.76)	23.82	0.89 (13.26)
UK	22.74	0.92 (10.48)	24.53	0.86 (8.34)	17.29	0.89 (13.92)

Note: Figures in brackets represent 't' values.

Table 8.36: Annual Growth Rates of Exports of Engineering Goods to Australia, New Zealand and USSR: 1970-71 to 1993-94

Country	1970-71 to 1980-81	R^2	1981-82 to 1993-94	R^2	1970-71 to 1993-94	R^2
Australia	21.19	0.89 (8.61)	22.36	0.89 (9.36)	15.98	0.90 (14.36)
New Zealand	12.57	0.37 (2.29)	-5.39	0.03* (-0.35)	10.50	0.47** (3.66)
USSR	28.67	0.94 (11.66)	11.75*1	0.48 (3.08)	24.05	0.91*2 (15.26)

* 1981-82 to 1986-87 only ** 1970-71 to 1986-87 only.
*1 1981-82 to 1992-93 only *2 1970-71 to 1992-93 only.
Note: Figures in brackets represent 't' values.

study, but it is not substantial. India is now exporting to new markets of the developed countries of Europe and America and the dependence on a few markets is being reduced gradually.

India's exports to Japan, West Germany and China have increased considerably. "This kind of geographical diversification in our exports emanated from the diversification programme of our industries during the plan period" (Varughese, 1993). "Diversification reflects the changing pattern of the country's exports in recent years as a result of industrialisation" (Dewelt *et al*. 1990).

CHAPTER IX

A STATISTICAL ANALYSIS AND STRATEGIES FOR INDIA'S ENGINEERING EXPORTS

This chapter presents a statistical analysis and strategies for India's engineering exports. This is divided into two sections. The first section deals with the statistical analysis of the concentration and diversification in India's engineering exports. The second section describes the strategies for export of engineering goods from India.

A: Concentration and Diversification in India's Engineering Exports

Concentration and diversification of India's engineering exports are explained by computing the following manner viz.,

1. Concentration coefficient by commodity, country and region.
2. Diversification coefficient by commodity, country and region.
3. Commodity, country and regional concentration ratio and

4. Commodity, country and regional concentration reduction ratio.

Hirschman-Gini Concentration Coefficient

The concept of concentration index adopted in this study is the one followed by Wadhva and Sharma (1975) in their study on exports of engineering products from India.

The commodity concentration index for exports of engineering goods adopted here is defined as,

$$C_E = 100\sqrt{\sum_{e=1}^{n}\left(\frac{X_e}{X_E}\right)^2}$$

where C_E = Commodity concentration coefficient

X_e = Value of India's exports of e^{th} engineering product and

X_E = Total value of India's exports of engineering goods.

The degree of commodity concentration is measured by the coefficient C_E, which is referred to as Gini-Hirschman concentration coefficient.

The value of the coefficient depends upon the number of commodities under consideration. The highest possible value will be 100 when exports consist of only one commodity. The value of the coefficient will be lower, the more evenly exports are distributed over the various possible commodity groups. The minimum value of the coefficient is given by,

$$\frac{100}{\sqrt{N}}$$

where 'N' is the number of commodity groups considered. And this value is assumed when all commodities are equally represented in total engineering exports of the country.

Country and regional concentration coefficients are defined in the same manner as the coefficient of commodity concentration. The country concentration coefficient 'G_E' is defined as,

$$G_E = 100 \sqrt{\sum_{g=1}^{n} \left[\frac{X_g}{X_E} \right]^2}$$

where X_g is India's exports of engineering goods to the g^{th} country.

The coefficient of regional concentration R_E is defined as,

$$R_E = 100\sqrt{\sum_{r=1}^{n}\left[\frac{X_r}{X_E}\right]^2}$$

where X_r is India's exports of engineering goods to the r^{th} region. The maximum and minimum values of the country and regional concentration coefficients are calculated using the same procedure as in the case of commodity concentration.

For measuring the diversification in India's exports, this well-known concentration index has been used by authors like Bhagawati (1970), Haldar and Richard (1973), Wadhwa and Sharma (1975) and Reddy (1975).

The results of the analysis are presented in Tables 9.1, 9.2, 9.3 and 9.4. It can be seen from Tables 9.1, 9.2 and 9.3, that in all the three cases, the coefficients showed a declining trend towards the minimum values thereby indicating increasing diversification by commodity - sector, country and region wise. The coefficient of commodity - sector-wise concentration

Table 9.1: Commodity - Sector-wise Concentration Coefficients for India's Engineering Goods: 1971-72 to 1993-94

Year	Coefficient
1971-72	57.81
1972-73	57.45
1973-74	56.39
1974-75	56.39
1975-76	57.22
1976-77	54.50
1977-78	56.23
1978-79	55.53
1979-80	57.35
1980-81	57.36
1981-82	55.52
1982-83	54.60
1983-84	54.81
1984-85	54.51
1985-86	51.45
1986-87	52.05
1987-88	50.79
1988-89	55.93
1989-90	55.58
1990-91	52.24
1991-92	51.35
1992-93	50.00
1993-94	51.45

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

Table 9.2: Regional Concentration Coefficients for India's Engineering Goods: 1970-71 to 1993-94

Year	Coefficient
1970-71	56.79549
1971-72	57.61096
1972-73	58.33371
1973-74	61.12432
1974-75	62.39432
1975-76	62.22201
1976-77	62.58626
1977-78	59.44015
1978-79	57.33955
1979-80	57.93257
1980-81	56.93964
1981-82	53.44179
1982-83	51.61314
1983-84	50.72060
1984-85	49.00578
1985-86	47.05412
1986-87	49.87001
1987-88	51.56411
1988-89	45.23273
1989-90	45.34006
1990-91	43.23492
1991-92	42.75991
1992-93	47.78948
1993-94	50.97963

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

Table 9.3: Country Concentration Coefficient for India's Engineering Exports: 1970-71 to 1993-94

Year	Coefficient
1970-71	22.19
1971-72	18.62
1972-73	19.19
1973-74	17.96
1974-75	19.65
1975-76	18.15
1976-77	18.73
1977-78	17.99
1978-79	17.89
1979-80	18.45
1980-81	18.78
1981-82	19.43
1982-83	24.38
1983-84	19.78
1984-85	22.23
1985-86	22.74
1986-87	30.69
1987-88	26.47
1988-89	27.64
1989-90	28.54
1990-91	28.16
1991-92	20.36
1992-93	17.40
1993-94	18.05

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

Table 9.4: Commodity Concentration Coefficient for India's Engineering Goods: 1982-83 to 1993-94

Year	Coefficient
1982-83	21.36334
1983-84	24.23270
1984-85	24.42378
1985-86	23.23637
1986-87	23.69872
1987-88	23.95471
1988-89	25.47796
1989-90	25.45291
1990-91	22.75545
1991-92	23.22293
1992-93	24.26053
1993-94	27.69212

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

declined during the period under review, from 57.81 in 1971-72 to 51.45 in 1993-94. The coefficient of regional concentration has declined from 56.79 in 1970-71 to 42.75 in 1991-92.

The country concentration coefficient increased from 22.19 in 1970-71 to 30.69 in 1986-87. This was largely due to the influence of some external factors like the Iran-Iraq war and the situation of unrest prevailed in that region which affected the export of India to these countries and most of the African countries also stopped importing engineering goods from India due to balance of payments problem. Thus the level of diversification in respect of countries decreased and that led to a rise in the country concentration coefficient to 30.69 in 1986-87. But India could manage to overcome these difficulties in the later periods and consequently the number of countries in India's export list and diversification in that area increased which resulted in a decline of the country concentration coefficient to 18.05 during 1993-94.

The pattern of variation of commodity sector-wise concentration coefficient during the period shows that the decline in concentration has taken place almost in a continuous manner. The coefficient of commodity sector-wise concentration taken as a whole declined by about 6 points during the period under consideration.

The range of variation of country concentration coefficient is between 30.69 in 1986-87 and 17.40 in 1992-93. The country concentration coefficient declined by 12 percentage points during this period.

Table 9.4 gives the commodity concentration coefficient with regard to 34 major commodity groups. This has shown an increasing trend and went up from 21.36 in 1982-83 to 27.69 in 1993-94. This means that the amount of diversification in respect of these commodity groups was decreasing gradually. Poor economic growth, inflationary tendencies, unsteady political conditions, Gulf crisis, collapse of the USSR and East Europe etc. were responsible for this trend. In 1990-91, though the commodity concentration coefficient touched a low of 22.75 points, the years that followed saw a rise in it (24.26 and 27.69 points respectively) due to the above-said conditions.

To obtain a broad idea of the trend in the coefficients, trend equations have been estimated from time

Table 9.5: Commodity Concentration Ratio (C), Diversification Index (D) and Concentration Reduction Ratio (R) of India's Exports of Engineering Goods: 1982-83 to 1993-94

Year	C(t)	D(t)	CR(t)
1982-83	50.39085	88.20300	-11.6139
1983-84	56.24324	88.20300	-11.6139
1984-85	57.72434	85.21745	-14.5532
1985-86	53.00651	94.72746	-5.1907
1986-87	53.44154	93.85054	-6.0540
1987-88	53.08283	94.57361	-5.3422
1988-89	58.47464	83.70503	-16.0421
1989-90	58.05152	84.55794	-15.2025
1990-91	47.68880	105.4466	-5.3621
1991-92	52.11563	96.52325	-3.4228
1992-93	56.79542	87.08994	-12.7097
1993-94	60.41762	79.78847	-19.8979

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

series of the coefficients of commodity-group, country and regional concentration for the years 1971-72 to 1993-94. The relevant period for commodity concentration coefficient is from 1982-83 to 1993-94.

The estimated equation for the commodity concentration coefficient is

$$\log G_E = 3.12126 + \underset{(1.92680)}{0.00938}\,T \qquad R^2 = 0.2707$$

It can be inferred from the above equation that T stands for time, the coefficient of the time variable is of the 't' value 1.92680 and is statistically significant at 5 per cent level, and the poor R^2 (.2707) tells that commodity diversification is not substantial overtime, rapid increase in production and exports of engineering products did not bring about substantial diversification in commodity composition. The fact that the value of the coefficient in 1993-94 was higher than that in 1982-83 shows that substantial diversification in commodity composition has not been taken place during the period under consideration.

The trend equations estimated for the country, commodity-group and regional concentration coefficients on the other hand, indicate geographic diversification to some extent in exports of engineering products during the period under consideration.

The estimated equations are

$$\log G_E = 2.91007 + 0.01099\ T \qquad R^2 = 1924$$
$$(2.28945)$$
$$\log R_E = 4.15255 - 0.01454\ T \qquad R^2 = 7360$$
$$(-7.8311)$$
$$\log S_E = 4.05246 - 0.0040\ T \qquad R^2 = 48$$
$$(-4.41514)$$

Concentration Ratio, Diversification Index and Concentration Reduction Ratio

Hirschman commented his formula on grounds of simplicity, intelligibility and expediency. However, the concentration coefficient does not give a clear idea about the extent of diversification. Attempts, therefore, are being made by economists to explain export diversification with the help of three alternative measures, viz., Concentration Ratio, Diversification Index and Concentration Reduction ratio.

Concentration Ratio

Following Gini, the concentration ratio has been defined as the Lorenzian area divided by the total area of the lower right angle (Morton Paglia, 1975). Being in percentage terms, the total area of the lower right angle, in the Lorenzian curve technique, is equivalent to 5000 sq. units. The Lorenzian area or the area of deviation can be calculated by subtracting the area under the Lorenz curve from the total area of the lower right angle. To find out the area under Lorenz curve, i.e., the area of deviation, an attempt is made at the beginning to measure the approximate area under the Lorenz curve using the following formula.

$$A = i\,(\Sigma RY - 50)$$

where A stands for the area under the Lorenz curve in square units; i the interval on the X axis which is equivalent to 100/n (n denoting the number of commodity groups). R the ranking of the element in the Y series in a descending order; and Y the percentage share of commodity groups/commodity.

The above formula gives the area under the Lorenz curve in square units. If we divide this area by 5000 sq. units and multiply it by 100 we get the area under the curve as a percentage of the area of the right angle triangle. If we deduct this from the total area of the right angle triangle, i.e., 100 per cent, we get the Lorenzian area in percentage terms; this is our concentration ratio. The concentration ratio C_t in year t in percentage points can be defined as:

$$C_t = 100 - \left[\frac{i(\Sigma R_y - 50)}{50} \right]$$

Diversification Index

Commodity, country and regional diversification is said to have taken place, if the Lorenz curve moves towards the line of equal exports and this will automatically increase the area under the curve. The difference between the area under the curve in the reference period and the base year is then considered as the area of diversification. This area, divided by the area under the curve in the base year, gives the extent of diversification. In order to compute the extent of diversification during the period under consideration, an attempt is made to construct a diversification index, D, with the help of the following formula.

$$D_t = 100 \left[\frac{\Sigma Ry_{tc} - 50}{\Sigma Ry_{to} - 50} \right]$$

where the sub-scripts 'tc' and 'to' refer to the current and base years respectively and the other symbols have the same meaning as in the case of the concentration ratio. This measure can also be defined in a simple form as follows:

$$D_t = 100 \left[\frac{A_t}{A_o} \right]$$

where 't' refers to the current year and 'o' to the base year.

Concentration Reduction Ratio

Besides the diversification index, concentration reduction ratio is also calculated for the data during the period under review with a view to measuring the magnitude of reduction in concentration by using the following formula

$$CR_t = 100 \left[1 - \frac{C_t}{C_o} \right]$$

This measure can also be defined in a simple form as follows:

$$CR_t = 100 \left[\frac{C_{to} - C_{tc}}{C_{to}} \right]$$

This is equally an important measure which gives us an idea about the extent of reduction in concentration. If this index is equivalent to 100, it can be said that the diversification is complete. If the ratio is less than 100, diversification is not complete and the actual values indicate the extent of diversification.

Though India's engineering exports have grown over the years and the number of product groups have increased, it seems that India still depends upon a fewer groups. A detailed analysis of 34 groups for a period of 12 years from 1982-83 to 1993-94 showed that during this period, except for 1990-91, the concentration ratio increased and there was decline in diversification. With 1982-83 as the base year, the diversification index in 1993-94 stood at 79.79.

The diversification indices together with the concentration ratios are given in Table 9.5. This shows

Table 9.6: Commodity - Sector-wise Concentration Ratio (C), Diversification Index (D) and Concentration Reduction Ratio (CR) of India's Engineering Goods: 1971-72 to 1993-94.

Year	C(t)	D(t)	CR(t)
1971-72	54.67	--	--
1972-73	54.00	101.49	1.23
1973-74	51.89	106.13	5.09
1974-75	51.08	107.93	6.58
1975-76	53.72	102.11	1.75
1976-77	47.74	115.30	12.69
1977-78	51.26	107.53	6.25
1978-79	51.50	107.00	5.80
1979-80	53.32	102.99	2.48
1980-81	54.14	101.17	0.97
1981-82	50.22	109.82	8.14
1982-83	48.22	114.24	11.80
1983-84	48.23	114.21	11.78
1984-85	47.99	114.75	12.23
1985-86	40.70	130.83	25.56
1986-87	42.75	126.30	21.81
1987-88	41.13	129.87	24.77
1988-89	50.37	109.49	7.87
1989-90	50.33	109.58	7.94
1990-91	44.29	122.92	19.00
1991-92	42.44	126.99	22.38
1992-93	38.57	135.53	29.45
1993-94	42.33	127.24	22.58

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

that with 1982-83 as the base, there is hardly any diversification. This still depends upon a few groups of commodity for her export earnings. Though the export earnings have increased, there was not any perceptible change in the diversification index during 1982-83 to 1993-94.

The results presented in Table 9.6 show that the amount of commodity-sectoral-wise diversification during the period under consideration is commendable. The diversification index showed an increase of 26.24 per cent, from 101.49 in 1971-72 to 127.24 in 1993-94. During the first 15 years of the period under consideration, i.e., from 1971-72 to 1985-86, the extent of diversification that has taken place is 30.83 per cent. But it declined to 9.58 per cent in 1988-89. Similar trends are seen in the case of concentration reduction ratio also.

These trends in commodity-sectoral-wise diversification are due to the fact that two important items of engineering exports have entered the list of exportables during the period 1981-82[1] and 1982-83.[2] Hence a sudden spurt in the diversification index from 101.17 in 1980-81 to 114.24 in 1982-83, an increase of 13.07 per cent

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1. Management and Technical Services
2. Electronics and Software exports.

in two years. During the period 1988-89 the diversification indices declined to 109.49 per cent. It is due to the removal of electronics and software items from the engineering export list.

The analysis of geographic diversification is done at eth regional level for 7 economic regions and at the country level for 94 countries to which India's engineering products are exported. Table 9.7 gives the concentration ratio, diversification index and concentration reduction ratio of engineering products by economic regions. Table 9.8 presents these results country-wise.

One important inference that can be drawn on the basis of the results presented in these tables and also in the earlier ones pertaining to commodity diversification is that there has been more geographic diversification in the case of engineering exports than commodity-wise diversification. In the case of engineering exports from India, it can also be seen that the geographic diversification is more gradual and continuous than the commodity diversification. Between 1970-71 and 1991-92 there was geographical diversification of about 51.71 per cent. Fluctuations were noticed in the concentration

Table 9.7: Regional Concentration Ratio (C), Diversification Index (D) and Concentration Reduction Ratio of India's Exports of Engineering Goods: 1970-71 to 1993-94

Year	C(t)	D(t)	CR(t)
1970-71	76.54	--	--
1971-72	76.76	99.05	-0.29
1972-73	77.15	97.39	-0.79
1973-74	78.45	91.84	-2.50
1974-75	77.86	94.34	-1.73
1975-76	78.76	90.52	-2.91
1976-77	78.76	90.53	-2.90
1977-78	77.17	97.28	-0.83
1978-79	76.12	101.78	0.55
1979-80	75.93	102.59	0.79
1980-81	75.27	105.41	1.66
1981-82	71.87	119.88	6.09
1982-83	71.53	121.35	6.54
1983-84	71.70	120.61	6.32
1984-85	68.15	135.76	10.96
1985-86	66.09	144.49	13.64
1986-87	68.83	132.85	10.07
1987-88	70.66	125.05	7.68
1988-89	63.06	157.41	17.60
1989-90	66.25	143.85	13.44
1990-91	66.51	142.73	13.10
1991-92	64.40	151.71	15.85
1992-93	70.55	125.51	7.82
1993-94	72.08	118.98	5.82

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

Table 9.8: Country Concentration Ratio (C), Diversification Inded (D) and Concentration Reduction Ratio of India's Exports of Engineering Goods: 1970-71 to 1993-94

Year	C(t)	D(t)	CR(t)
1970-71	74.63	--	--
1971-72	71.47	112.44	4.23
1972-73	73.86	103.01	1.02
1973-74	71.40	112.72	4.33
1974-75	71.77	111.24	3.82
1975-76	70.75	115.29	5.20
1976-77	70.85	114.87	5.05
1977-78	70.02	118.13	6.17
1978-79	68.76	123.10	7.85
1979-80	72.69	107.63	2.59
1980-81	72.75	107.40	2.52
1981-82	68.76	90.51	7.85
1982-83	83.91	63.39	-12.45
1983-84	84.23	62.13	-12.88
1984-85	101.08	56.15	-35.44
1985-86	87.62	48.80	-17.41
1986-87	89.29	42.22	-19.65
1987-88	87.42	49.57	-17.15
1988-89	83.94	63.29	-12.49
1989-90	83.33	65.70	-11.66
1990-91	84.50	61.08	-13.24
1991-92	75.26	97.48	-0.86
1992-93	71.17	113.62	4.63
1993-94	73.43	104.72	1.60

Source: Calculated on the basis of the data published in Engineering Export Promotion Council, various issues, Calcutta.

ratios. It can be noticed that the diversification trend has fallen after 1992-93.

It may be inferred from Table 9.8 that between 1970-71 and 1978-79 there was a country diversification of about 23.10 per cent. Stagnancy was noticed in the concentration ratios during this period. During the short period, 1981-82 to 1986-87, there were some disturbing trends. It can be noticed that the diversification trend has set in only after 1988-89. The year 1992-93 saw a 13.62 per cent diversification.

This clearly establishes the fact that during the period of study, the geographic diversification is greater than country and commodity diversification.

B. Strategies for India's Engineering Exports

Notwithstanding the progressive trend in engineering exports, it would be pertinent to consider here some of the key problems that impede the industry's growth and thereby adversely affact India's overall export performance. The strength of these factors are evident from the fact that that India's share in the world trade in engineering goods is only around 0.17 per cent. Hence in assessing the export performance of engineering goods, it is necessary to look at the problems and difficulties faced by the industry. Arora (1993) had made such an analysis and came to the following conclusions:

1. With the massive technological changes which have taken place in the developed market economies, many of the advantages accruing to India on account of inexpensive labour have become redundant.

2. Taiwan and South Korea, which were only marginal exporters of industrial items in the world during the "sixties and seventies", now provide stiff competition to us.

3. China, with substantial induction of foreign technology into its manufacturing industries and elaborate overseas contacts, is posing a formidable challenge to the expansion of our engineering exports, and

4. With fundamental changes in a host of product mechanisms and new material substitutes, there is a manifest reduction in the purchase of traditional engineering components required for various uses.

Most of these problems are, in fact results of the economic policies which the nation followed.

Lack of Integrated Approach

An important reason for the poor performance of India's engineering exports at the global level is absence of an integrated view of the development potentials and development objectives and a long-term strategy based on such an integrated approach. Needless to say, absence of definite objectives and policy directions as well as inadequate analysis of the environment have led to this impasse (Francis Cherunilam, 1994).

So, it is necessary to evolve an integrated strategy, which should aim at enlarging the production base and strengthening the marketing effort for generating higher exports. Formulation of such a strategy is important not only for earning additional foreign exchange but also for injecting a qualitative change and confidence into this grown area, so that it can successfully sustain itself in the present international environment, which is undergoing dramatic changes, such as closer integration of European Community, unification of two Germanys, structural adjustments in East Europe, North America Free Trade Area

(NAFTA) and a prospective regional bloc of the Pacific-Rim countries, including Japan. Establishment of diplomatic relations with Israel, and lifting of ban on trade with South Africa will, however, provide an additional opportunities for export of engineering goods to India. Various steps envisaged under this strategy are outlined in the following paragraphs.

Selective Approach

A quantum jump in the export of Indian engineering goods cannot be achieved in the present state of our industrial set-up, constituting various sizes of units spread over fairly wide area. Facing numerous problems on account of raw material shortages and infrastructural deficiencies, many of these units can hardly match overseas requirements in terms of technology, quality, and cost. In view of multiplicity of demands on our scarce resources, selectivity is the only practical solution. Based on this approach, an effort should be made to identify a few potential items and give them "total policy packages" of incentives and other contemporary inputs required for export production and marketing in respect of specific overseas destinations. Such an orientation to industrial base will give rise to a class of products which should be rigorously promoted for export.

The Kapoor Committee Report on"Perspective plan and Strategy for Export of Engineering and Capital Goods" has very thoughtfully given expression to this idea and identified a number of products for providing necessary thrust to India's exports. The Government of India has also accepted this approach.

In view of the high growth expected of Indian engineering exports, this process and its implementation need to be expedited.

Marketing Reorientation

Till now, India was exporting over 70 per cent of her engineering products to Asia and Africa. Their requirement being simple marketing in thos countries was rather easy. Further, many of the Indian goods sold in these markets did not require any major adaptations. Now, with gradual shift in the markets for engineering goods from Asia and Africa to North America and other developed regions, Indian exporters have to adjusted to the new environment. But they have not yet been able to adapt fully to the demands of the new markets in terms of quality, price, delivery schedules and range of goods. For instance, the North American and West European markets are used to be highly competitive to prices and to quick deliveries. In these two areas, however, the Indian exporters are unable to outbid their rivals from other countries even when they match the quality requirements.

The situation has become far more difficult with the unification of the EC, which made member countries more demanding. Incidentally, after the unification of Europe, ISO 9000 is now reckoned as a norm rather than an exception and unless we adopt this standard, the wider choice available will simply spell disaster for us. With a view to meeting this challenge and exploiting the vast potential and new opportunities emerging from the European verification, Indian exporters should re-orient their marketing methods and product structure through planned modernisation, quality improvement, technological upgradation and price effectiveness. Some of the specific measures that need to be taken in this context are:

1. Establishment of warehouses to ensure off-the-shelf supplies;
2. Setting up of joint ventures or acquisition of companies in Europe for manufacturing/distribution;
3. Buy-back arrangements through transfer of technology in India; and

4. Encouraging selected foreign investment and export-oriented industries in India.

Team Work

Team work is another important consideration for raising Indian engineering exports. This is particularly so in the case of turnkey projects, where too many functions are involved and it is difficult for a single agency to execute the job single-handed. For instance, for the execution of a complete sugar plant, one would need to care for:

1. Supply of plant and machinery;
2. Civil engineering for factory and office buildings, machinery foundation, housing, roads and railways, etc;
3. Supply of agricultural machinery and transport, and planning and development of agricultural estates for cane growing;
4. Commissioning of the plant; and
5. Training of personnel to finally run the plant.

Policy Implementation

The role of industrialisation in India's economic development has been well recognised even much before independence; an Industrial Policy Resolution was made shortly after the attainment of independence and it was reformulated in 1956. However, no such enthusiasm was shown to deviate from the colonial trade regime and to formulate a comprehensive export development strategy. It was only in 1970, about two decades after the launching of development planning and 22 years after making the first Industrial Policy Resolution, that the Government of India made an Export Policy Resolution, in spite of the fact that the Import and Export Policy Committee (Mudaliar Committee) 1961, and several authoritative spokespersons had pointed out the need for active export promotion.

In its anxiety to narrow down the yawning trade gap, the Government of India has taken a series of measures in the areas of licensing, export promotion and simplification of procedures during the past few years. There exists a substantial gap between the announcement of various policies and formulation of procedures for their implementation. "It may be noted that in spite of the identification of the thrust sectors, no major thrust has been made in most cases for their proper development" (Francis Cherunilam, 1994).

Consequently there was a considerable setback on the part of exporters initiative which eroded their interest in the business. Since the process of liberalisation is not yet complete and the present Government is committed to open the economy further for reinforcing competitive forces, it would be necessary to devise a mechanism, through which the implementation of different policy measures is ensured quickly. The Cabinet Committee on Trade and Investment constituted under the chairmanship of the Prime Minister should take adequate care on this issue.

Trade Information System

Export marketing is a complex operation and success in exports is greatly dependent on the ability to take timely action to exploit opportunities that arise from time to time, in overseas market, analyse fast the international market trends and evolve a realistic market strategy. But "our marketing infrastructure as well as marketing techniques are neither effective nor efficient." We do not have any machinery to keep prompt track of overseas business information as is done by JETRO in Japan, KOTRA in Korea, CETDC in Hong Kong and STDB in Singapore with wide network of offices abroad. These organisations have evolved efficient systems which help them to get information pertaining to tenders and the like much before these are released officially. In India, we are getting these informations, at times after the expiry date. India has, no doubt, a plethora of organisations - government - semi-government as also non-government - engaged in this task in one way or the other. Yet we do not have an easy access to market intelligence and information (FICCI, 1988). One of the weakest links in our trade affairs is the poor trade scouting (Paul, 1992).

The Tandon Committee has pointed out that our exporters often "miss the opportunity of participating in global tenders because of late receipt of tenders, sometimes, changes in policies and procedures in overseas countries do not reach them in time...the information is not available on a continuing basis from any source."[3]

The Task Force on Export Services constituted in June 1978 by the Government of India and the Abid Hussain Committee drew attention to this problem. However, the problem still continues.

At present, the Engineering Export Promotion Council, India Trade Promotion Organisation, India Investment Centre, Indian Institute of Foreign Trade and

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3. Government of India, Report of the Committee on Export, Strategy for Eighties, p.288.

Confederation of Indian Industry, etc. provide marketing information to individual exporters. Due to resource constraints, it has not yet been possible for Export Promotion Council to build up an efficient system of collection, analysis and dissemination to overseas marketing data information so badly needed for effective export planning. The EEPL, which aims to achieve an export target of $10 billion by the turn of the century is worried about possible closure of its Singapore, Nairobi, Dusseldorz and Chicago offices if the government does not provide 90 per cent subsidy for running them (Economic Times, 26 Sept. 1995). There is a need to set up a National Data Collection and Information Centre on overseas trade.

The changes necessary in the present set-up are:

(1) Gathering and critically analysing market information; product surveys on the host country's market, trade documentation etc.

(2) Market testing of a product and feed-back the relevant information for product modification or adaptation.

(3) Product display, participation and/or organisation of trade fairs, trade fairs may be both broad-spectrum or specialised.

(4) Seminars and workshops in order to increase the awareness about the products in the host market.

(5) Developing business contacts and making the bilateral contacts and negotiations.

(6) Promotion at the host governmental level in order to know and possibly influence present and future policies.

(7) Monitoring a product after promotion for any necessary feedback and correction.

(8) Looking out for future opportunities and threats in the host country market.

(9) Manning commercial divisions of Indian Embassies abroad with professionals, pooling marketing information available with various overseas offices of Indian export promotion agencies, and creating a centralised marketing intelligence.

It is hoped that establishment of the recent reported Trade Point in India under the auspices of UNCTAD will solve the problem to a considerable extent. "There are several international trade fairs such as: Hanover Fair for Machine Tools, Koln Fair for Hand Tools, a Bicycles Fair at Milan, ELECTRONICA in Munich, INTERKAMA in Dusseldorf, COMPEC in UK, Salon des COMPOSANTS Electroniques, Paris, AUTOMEKANIKA Fairs etc. However, India does not participate either frequently or on any large scale. It is also worth noting that the Trade Fair Authority of India (TFAI) does not have any office in Europe. In these days of heavy competition, a seller must come to buyer's door to show his products" (Chary, 1992).

Technology Upgradation

Technological problems have had very serious effect on India's exports. The Tandon Committee which observed that there is growing feeling that whereas in the 1950s and 1960s our technology gap with the world was narrowing, today it is widening. The Committee observed that: "There are many things we make today that have hardly progressed in technology since we started making them. This gap we should close, at least in the export sectors, and import technology from wherever it is more advanced than ours".[4]

The Committee on Trade Policies considered the widening technology gap as an important factor causing the worsening of India's competitiveness in the international market. The Committee has stated that: "In many sectors, particularly in manufacturing activities, these problems which reduce the competitiveness of our exports have worsened over time. As the technology lags have increased, the productivity differentials have widened and the costs of inputs have continued to rise".[5]

Even today exports of many products are hampered by our technological backwardness. Even several of those sectors identified as thrust sectors for export development suffer from this problem: "The production capacity for most of these items in the country is small. The range is limited, the design, finish and packaging is not up to the world standards and efforts have been lacking in modernisation, technological upgradation product development and research" (Gard, 1989).

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4. Ibid, p.97.
5. Government of India, Report of the Committee on Trade Policies, 15.

It is therefore, necessary to upgrade the technology for industries with a truly impressive export potential. For technological upgradation of industry, a number of provisions exist in both the industrial and import policies of India. The Ministry of Industry has also created a Technology Development Fund to look after the foreign exchange requirements of existing units for import of small balancing equipment having a strong impact on quality and quantity of output, technological know-how, foreign consultancy services, and drawings and designs. Attention of manufacturers must be drawn to proper finishing and packaging of goods. This is an area where even small countries like Taiwan and Korea score over India.

Strategy with Regard to Price Factors

Effective and dynamic pricing policy constitutes an essential element of a dynamic marketing strategy, particularly with a view to achieve the desired rate of growth in engineering exports.

India suffers from a deficiency in respect of price competition mainly owing to her technological, managerial and financial constraints. India's efforts in this direction are mainly thwarted by the technologically advanced and financially sound international competitors. For example, India suffers from price disadvantage with Japan in Thai market. "The market, especially for imports, is highly competitive and competition has never been tougher that at present particularly in respect of prices and terms" (Singhal, 1987).

Similarly, "it has been estimated that export marketing of Indian hand and cutting tools has been facing a price disadvantage of about 15 to 35 per cent". In the case of machine tools and tractors this region between 30 to 50 per cent (Lajpathi Rai, 1987).

From the above facts it may be inferred that technologically sophisticated products are 'difficult to sell items' for developing countries like India.

It will not be out of place to mention here a typical feature of international marketing. It is generally believed in the sphere of international marketing that low priced goods coming from less developed countries are invariably of inferior quality. Hence, the old contention that low price leads to maximisation of sales losses its weight in international marketing. However, effective publicity and demonstration will definitely add to the changing preference in favour of the low-priced goods provided importers are induced to import and distribute qualitative goods at low prices. Even higher priced goods may yield good results in export markets. But for a consumer product to compete successfully at a price above the market, it must either be differentiated so strongly in order to make consumers believe that it is superior to the then competing brands or to transport middlemen to promote it heavily.

Poor Quality Image (Educating Buyers Abroad)

India has a very poor quality image abroad. In spite of the measures taken under the Export (Quality Control and Inspection) Act and other laws, our exports continue to suffer because of the quality problem. In several markets abroad, India is still known as a supplier of traditional items like tea, jute, textiles and spices. This image of India is more pronounced in developed countries, where he has yet to make a meaningful dent in the export of engineering goods. On several instances, carelessness or lack of commitment on the part of the exporters is also responsible for this. Adulteration and duping are also not uncommon. Although ultimate success will largely depend upon the actual performance of Indian exporters, yet education of potential buyers abroad will go a long way in improving India's export prospects. The government must make efforts at projecting India's image as an emerging force to reckon within the industrial scene.

Third World Ties

India has so long looked upon the West for markets, what is needed to-day is to change gradually her dependence on the West and search for possibilities in countries around her. While the developing countries are under pressure from the developed countries to open their markets to goods produced by them protective barriers are being put up against entry of goods from the developing countries. With the emergence of trading blocs and unilateral and arbitrary actions in settling trade disputes, protectionist tendencies among the developed countries have accentuated.

This necessitates strong economic and trade ties among the Third World countries. We should encourage, therefore much more than ever before trade promotion among developing countries. This would help generate higher exports of engineering products from India. A real breakthrough in this regard is possible through intensive trade talks, exchange of trade delegations, identification of products with trade potential and imaginative and determined marketing. Moreover, closer co-operation between the developing countries would ensure economies of scale in production.

Involvement of Large Units

The large industrial houses must be roped into the exporting area. Inspite of innumerable incentives, the big houses have not contributed their might to the country's export drive. Nearly 80 per cent of Indian engineering exports are effected by 300 companies operating mainly in the medium and small-scale sectors. The effective production capacity of these units cannot be stretched further.

As against this, the contribution of large units is peripheral. According to an Engineering Exports Promotion Council's study, "about 75 large units with production worth of Rs.4,000 crore are exporting nearly Rs.30 crore worth of engineering goods annually" (Paul, 1992).

As per the Commerce Ministry sources, "exports from industrial giants constituted only four per cent of their total turn over" (Economic Times, 1989). On the other hand, these companies have been involved in heavy imports of capital goods resulting in sizeable outflow of foreign exchange resources. With a view to expanding our engineering exports, it is, thus, necessary that the large units should export a certain percentage of their output.

Public Sector Enterprises

A major respect of the export strategy for the next decade should be immediately concerned with boosting exports from public sector enterprises, especially the Central Government controlled enterprises. "At present, the public sector exports account for about 20 per cent of the total exports of the country. This is too small a proportion considering that the paid up capital in the Central Government Companies alone would be about three times that of private corporate sector as a whole" (Chattopadhyay, 1990).

With a view to improving their export performance, it would be worthwhile to identify selected public sector units for greater involvement in this activity. Such an effort on the part of these units would require strengthening of their export cells, improvement in marketing services, including after-sales service, upgradation of technology, adoption of consortium approach in collaboration with other exporters - and higher productivity and quality. The Kapoor Committee has duly emphasized public sector exports and advocated that public sector units should draw up long-term export plans. All this may, however, be possible only if some of these units are privatized.

Project Diversification

Project and market diversification is another important factor for raising exports of Indian engineering goods and services. In the wake of the sudden deceleration in overseas projects business, particularly in the Gulf region where we have concentrated on all these years, it will not be possible for us to effect a quantum jump in this sector.

In such a situation, while basically aiming to maintain a continued foothold in this region, Indian exporters should simultaneously diversify their activities by gradually moving into some other markets which indicate considerable potential.

Enlarging Buyer's Credit

Owing to the debt problems and the ubiquitous foreign exchange shortages, a number of developing countries in both Asia and Africa have considerably curtailed their overseas purchases of industrial products. A major part of the meagre imports into these countries is supplied either under funds from multilateral agencies or credits extended by exporters from Japan and Western countries. India has also exported some engineering products to selected markets in these regions under a credit line provided by the Exim Bank. For maintaining the traditional markets for our engineering exports, the volume of both the Government and Exim Bank credits to these countries should be enlarged. It will also be desirable for Indian exporters to enter into counter trade deals with importers abroad, where necessary.

Promotional Freight Rates

With a growing shift in the export of Indian engineering goods from Asia and Africa to North America and other regions of the developed world, exporters find themselves extremely uncompetitive because of higher freight rates for long distances involved. With a view to solving the high-freight problem, India should introduce a system of promotional freight rates for both rail transport and shipping. It would also be necessary to provide the concomitant "entry price support" also to engineering exporters. A Planning Commission subgroup has already recommended such a measure. As the value of supplies increases, the entry price may correspondingly be reduced.

Delivery Schedules

Strict adherence to agreed delivery schedules is crucial for export success as is air for life. No explanation, however genuine, can be a credible substitute for timely despatch of goods. Timely delivery is, thus, the key factor in international trading, involving credibility of the country as a whole. In India, average delivery time for an order was six months, while Singapore, a much smaller port, took only one month for the same (United News India, 16 August, 1995). There could be instances, when delivery schedules are upset owing to disrupted sailings, power cuts or industrial strikes/lockouts, but the overseas buyer who has option to procure his requirements from anywhere in the world is hardly concerned about our problems. "Short delivery periods helped Japanese firms enter into the USA market in the 1970s" (Jan Peter Wogart *et al*. 1993).

After Sales Service

Our scant regard for after-sales service stems from our ignorance of modern industrial culture. It is accentuated by our protected domestic market. It emanates basically from the absence of customer orientation in our marketing system, which had seldom gone beyond the production disposal operation. This serious lacuna, has spoiled in many cases, the image of our engineering exports. With suitable incentives offered to overseas collaborators, effective after-sales service could be depended upon for providing a sizeable boost to our engineering exports.

Trade Fairs

Regular participation in trade fairs should be encouraged. In these fairs, the industry is exposed to the foreign markets, their requirements and specifications. Hence, special importance should be given to participating in these trade fairs.

Entry Support for Engineering Export

The suggestion given by the Planning Commission sub-group on engineering goods exports in respect of entry price support should be immediately implemented for achieving a breakthrough in the global market. It is pointed out that if the Eighth Plan is to witness a sharp rise in engineering exports to the developed markets, at least a 15 per cent entry price support must be given to importers.

Introduction into a Competitive Environment

Several companies in the newly industrialised countries have adopted the "frontier following" strategies, which lets other firms take the risks and incur a expenditures in introducing new technologies. These firms have then followed up with a matching product that does better than the leaders in terms of cost or special features, or any combination of these traits.

These strategies take advantage from the experience of countries that are now important global players.

CHAPTER X

SUMMARY AND CONCLUSIONS

A nation's economic growth is not determined by its production alone. Its export performance has an overall command upon the economic development, especially in countries like India which are striving for development. A high level of export earnings shape the national economy in many ways. For example, export performance provides the much-needed foreign exchange for acquiring capital goods, machinery, raw materials and other resources necessary for industrialisation.

Further, it finances the import and maintenance of sophisticated and specialised machinery, spares and parts for existing plants, machinery required in the higher stages of industrialisation and helps the economy to meet the growing debt servicing charges. In the long-run the capacity of the country to produce and export goods and services on a continuing basis at competitive prices in the international markets is of great importance especially for India.

Major Issues

This work is mainly concentrated on the engineering goods exports. Its growth, concentration and diversification through the decades under study has been analysed thoroughly and suitable suggestions are given in the end to shape the future policy which may help to boost the export of engineering goods. It is important to note that the major part of the study has been carried out in the background of liberalisation of the Indian economy in general and export-import sector in particular.

The study discusses in detail the following aspects:

1. The growth and trends in India's engineering exports;

2. The role of engineering exports in India's overall exports, Gross National Product (GNP), Net National Product (NNP) and Gross Domestic Product (GDP);

3. The items of engineering exports; and

4. The direction of India's engineering exports from regional and country-wise angles.

Apart from the above, some other ancillary matters such as India's export performance in the past two decades in comparison with other countries' experiences and the influence of engineering industry on national development have been discussed with a view to understand and reformulate the present policy of engineering exports.

The present study has led to the following inferences:

Development of Engineering Industry

The impact of industrialisation adopted in the second Five Year Plan and the continuous attention bestowed by the government in this aspect resulted in tremendous growth of engineering industries. During the pre-Plan era, India had only a few light engineering units and she was largely depending on foreign countries to meet her own requirements. The Plan period brought at a sea change in the different sectors of industry and particularly in the engineering industries sector. Today the engineering industry plays a dominant role in the overall exports of the country.

The growth of engineering industry in the field of productive capital, net production, foreign collaboration, employment generation, exports, research and development etc. has been really remarkable. The engineering industry, today, accounts for nearly one-third of the country's activity, engages 33 per cent of productive capital in industry, shares 33 per cent of value added by manufacture and employs 30 per cent of industrial labour force. Its share in the total research & development expenditure is 66 per cent. Nearly 62 per cent of foreign collaboration is also in this sector.

Spectacular Export Growth - But with Mixed Trends

The growth of engineering exports is remarkable in terms of money and percentage of India's total exports.

Today the industry has attained a dimension and capability unrivalled anywhere in the developing world with an exhaustive export list that ranges from small pins to heavy engineering goods. Exportable engineering goods have been classified into four categories: (1) Capital goods; (2) Primary steel and pig-iron based items; (3) Non-ferrous products; (4) Consumer durables and (5) Management and technical services.

Though industrial production has shown positive progress, in terms of exports, the picture is not that rosy. In the year 1970-71 the share of engineering goods exports in engineering goods production was 3.3 per cent only. In 1991-92 it went up to 5.1 per cent.

Holding its dominant position and higher level of growth in the industrial sector, the Indian engineering industry has recorded a spectacular rise on the export front from a low level of Rs.5.16 crore in 1956-57 to about Rs.8,725 crore in 1993-94.

There is a positive correlation between engineering exports, total exports, Gross National Product, Net National Product and Gross Domestic Product.

In the 36 year period from 1956-57 to 1992-93 India's engineering exports increased at a compound rate of 19.43 per cent per annum. Overall exports rose by 12.01 per cent, Gross National Product by 11.15 per cent and Net National Product by 10.94 per cent during the same period.

Of the 98 commodity groups listed by the Engineering Export Promotion Council 51 commodities were present in the list of exportables in 1956-57 and 61 in 1960-61.

Along with the remarkable growth in terms of monetary value and the quantum of countries engineering goods exports, there has been a significant expansion in the range of engineering items being exported from India. India's export list now ranges from such minor items as the small pins, hand tools and auto parts to a wide assortment of machine tools, electric and related goods, steel and non-ferrous products, forging and castings, besides an array of heavy engineering items that include industrial plant and machinery, fabricated steel structures, cars, jeeps, trucks, wagons, tractors and farm implements, two-wheelers and three-wheelers etc.

Sector-wise Growth Rates

A sector-wise analysis since 1956-57 brings out the shift in the structure of India's exports. Capital goods showed a steady increasing trend from 12.1 per cent of total engineering exports in 1955-56 to 40 per cent in 1971-72. Exports fell to 35.70 per cent at the end of 1990-91 and still further to 27.62 per cent in 1993-94. Similar trends are also seen in the case of consumer durables which increased from 33.70 per cent in 1955-56 to 41.9 per cent in 1980-81 and then declined to 29.29 per cent in 1990-91 and to 24.3 per cent in 1993-94.

On the other hand, the item registering the sharpest decline in relative share was non-ferrous products which declined from 21.3 per cent in 1955-56 to 3.6 per cent in 1971-72. Of late non-ferrous product exports were rising in terms of percentage values reversing the earlier trend.

The steel-based items comprised 32.9 per cent of the total exports in 1955-56, but their share fell to 17 per cent in 1980-81. Of late their exports were rising substantially and their share increased to 34.68 per cent in 1993-94.

Management and technical services in the engineering field which got momentum of exports in mid 80's contributed to the engineering exports. Though India is having the third biggest trained manpower in the world next only to USA and Russia, its percentage contribution in India's total engineering exports is around 6.5 per cent only.

Growth Rates of Commodity Groups

Throughout the period under study and during the sub-periods, non-ferrous products registered higher growth rates than capital goods, primarily steel and pig iron-based items and consumer durables. But the R^2 value of the fitted regression is less than other values in all these years.

During the whole period under consideration, capital goods and primarily steel and pig iron-based items have grown at 15.30 and 15.27 per cent respectively per annum. On the other hand consumer durables and management and technical services showed growth rates of 15.28 per cent and 17.59 per cent respectively. The R^2 value of capital goods and consumer durables is higher than other commodity groups. Though management and consultancy services show a higher growth rate, its R^2 value is very less in comparison.

Growth Rates of Principal Exports

Of the 33 principal export items considered, all the commodities, except wagons and coaches, exhibit positive and significant growth rates.

Thirtytwo commodities showed positive growth rates, of which the export of 17 commodities, namely fabricated steel structures, complete vehicles, steel pipes and tubes, ferrous halloware, industrial fasteners, industrial castings and forgings, ferro alloys including charge chrome, steel products N.O.S., aluminium utensils and others, EPNS wares and others, auto parts, bicycle and parts, hand, small and cutting tools, industrial combustion engines, air compressors, sewing machines, needles and scientific instruments increased at a faster rate than the total engineering exports of the country during the period 1981-82 to 1993-94.

The highest growth rate has been exhibited by industrial castings, aluminium utensils and others, EPNS wares and others and auto parts.

A disturbing feature of the export performance is that items like wires and cables, wagons and coaches, fabricated mica and mica products and batteries, recorded less than 10 per cent growth rate. This is due to the fact that many developing countries of Asia and Africa have launched a programme of industrialisation through import substitution during the late seventies and eighties. As a result of this, these countries started producing less sophisticated engineering goods on their own. Commodity diversification is not substantial during the period of the study. Rapid increase in production and exports of engineering products did not bring about substantial diversification in commodity composition.

Region-wise Growth Rates

India's major markets during the sixties were South East Asia, West Asia and Africa. They had 34.45 per cent, 24.53 per cent and 19.69 per cent shares respectively. The annual average contribution of West Europe, East Europe and North America in India's engineering exports during 60s were 7.2 per cent, 5.04 per cent and 4.24 per cent respectively. During the same decade contribution of Australia in India's engineering exports were not significant enough.

In 1970s West Asia emerged as the largest region for India's engineering exports with a share of 26.12 per cent as against South East Asia during 60s.

South East Asia's annual average share dropped to 25.73 per cent in 70s from 34.45 per cent in 60s. This can partially be attributed to furthering the export effort in other regions viz. East Europe, West Europe and North America. As a result, the contribution of West Europe, East Europe and North America increased significantly to 10.37, 9.19 and 6.09 per cent respectively during 70s.

During 1980s East Europe has emerged as the largest market for India's engineering goods with an annual average share of 19.38 per cent. The other three important regions where India's annual average share went down during 80s are South East Asia, West Asia and Africa and their annual average share during 80s were 16.03 and 14.81 per cent respectively.

Percentage-wise, the imports of India's engineering goods by the countries of South East Asia declined from 34.27 per cent in 1956-57 to 20.43 per cent in 1990-91 and then increased to 33.37 per cent in 1993-94. In case of West Asia, it declined from 38.58 per cent in 1956-57 to 7.43 per cent in 1990-91. Similar trends could be seen in case of Africa whose share declined from 23.23 per cent in 1956-57 to 10.03 per cent in 1990-91.

East Europe, which was not an important importer of India's engineering goods in 1956-57, accounted for 29.07 in 1986-87. After that the importance of East European countries started declining. The relative share in the year 1993-94 declined to 2.73 per cent from 29.07 per cent and 25.28 per cent in the years 1986-87 and 1990-91 respectively.

The regional distribution of India's exports of engineering goods over time shows that a substantial market for these goods was found in the advanced countries of Europe and America. The rates of growth of imports of engineering goods from India are consistently higher for Europe and America than for Asia and Africa. It shows that India has diversified her exports of engineering goods over the period regionally and that the excessive dependence on the markets of Asia and Africa is on the decline. In terms of their relative share and an increase in their imports from India, Europe and America showed more buoyancy than Asia and Africa.

Principal Markets

India's engineering products are exported to 94 countries in the world as per the Data of Engineering Export Promotion Council.

India's principal markets for engineering goods are as follows:

1. South East Asia: Sri Lanka, Bangladesh, Malaysia, Thailand, Indonesia, Singapore and Japan.

2. West Asia: UAE, Iraq, Kuwait, Saudi Arabia, Iran and Bahrain.

3. Africa: Egypt, Nigeria, Kenya, Tanzania, Zambia, Uganda, Sudan and Ghana.

4. North America: USA and Canada.

5. South America: Chile, Argentina, Brazil and Columbia.

6. Australia: Australia and New Zealand.

7. West Europe: Germany, United Kingdom, France and Italy.

8. East Europe: Erstwhile USSR

The exponential growth rates of exports from India to these countries show that the rates of growth are higher for the advanced countries like Japan, USA, United Kingdom, France, Italy, Germany and Australia. A snap decision taken by any of these countries to restrict imports, or increase tariffs would drive away the Indian goods from such markets. India's exports to Japan, Germany and China have increased considerably. This kind of geographical diversification in our exports emanated from the diversification programme of our industries during the plan periods. Diversification reflects the changing pattern of the country's exports in recent years as a result of industrialisation. Thus the major portion of India's engineering exports until recent years went to the neighbouring countries.

United States of America was the second largest customer for India's engineering items after the USSR till 1990-91. At present USA is the biggest customer for India's engineering products. The percentage share held by USA is 10.32 in 1993-94. After the disintegration of USSR, it is no longer India's customer for engineering goods.

In 1993-94, China with 6.18 per cent, emerged as an important market for engineering items from India. China was not importing any engineering item from India till 1990-91.

Japan also emerged as an important market for India with 4.5 per cent share during 1993-94. United Kingdom remains a major importer of India's engineering items with 4.7 per cent.

The overall analysis reveals that we have achieved considerable growth during the past four decades in spite of many obstacles and hardships. The industrial policy and the consistent attention by the government now make India to move towards its goal in a positive manner. The industrial sector is influencing the economic development in a large-scale. Notably, engineering goods export plays a remarkable role in this process.

In the changing global scenario, the need of the hour is for highly skilled and expert personnel. Having the third largest source of skilled personnel, why India is lagging behind many countries in the export of trained manpower? If the government had given sufficient attention to this aspect, India would have achieved a tremendous growth.

It is evident from the commodity-wise analysis that India can export many commodities which are already exported by developed countries. Developed countries have lost interest in many commodities due to economic, social and legal reasons. The medium and small-scale industries can have a say on the future exports of those commodities because the capital required is comparatively less and the availability of cheap local labour. Apart from this, the laws relating to environment and the policy guidelines of India is more conducive to encourage the Indian engineering sector compared to the stringent regulations adopted in most of the developed countries. The trade gap created by the developed countries because of the economic, political and legal reasons can be filled by India. Hence a re-orientation and a new thinking to promote the engineering industries is required in India.

The region-wise study of engineering exports and the experience of other countries reveal that there is no uniform pattern of export policy in India. The study shows that India has major trade relations with Asian countries. This regional concentration resulted in the high rate of growth in the percentage of engineering exports to this region, but in terms of money the value is minimum.

At the present juncture, the question is with which region or with which country should India have close trade relations? The answer is obviously not one. The reasons are that now world is witnessing a multilateral trade through the mechanism of World Trade Organisation, after GATT in 1994. A uniform pattern of tariff and trade agreement has been signed by the major countries. This gives moral and legal support to India and in future, with sufficient checks and balances, India can have trade relationship with other countries, concentrating on notable engineering goods exports based on the requirements of other countries and India's ability.

Apart from globalisation, many regional agreements, both legal and economic in nature, have been signed. For example SAFTA, NAFTA, OPEC and EEC. The recent trends like the unification of European countries under European Economic Community and the universal pattern of free trade adopted by the members are fresh experiences to India and we should concentrate on region-wise trade relations.

Further, the other important aspects are the trade experiences of Japan, South Korea, Taiwan etc. During the middle of this century, these countries were economically and technologically backward. Their constant dedication to quality products attracted many countries of the world and now they are in a far advanced position because of their exports. Hence India should concentrate not only on quantity, but also on quality of exports, especially engineering exports.

After liberalisation, many policy changes have been introduced. Still India is lacking a Unified

Information System. Moreover, the nonadoption of credit policy has adversely affected trade relations with many countries. Apart from these the nonadherence to export guidelines for quality control by the exporters also makes a negative impact on India's exports. To overcome these hardships, the Ministry of Finance, in consultation with Ministries of Trade, Commerce and Industry, can provide current and reliable information about the opportunities and rules and regulations of exports to many foreign countries.

The credit policy may be adopted, by which, in the long run, the volume of exports to many countries can be increased. Thus those countries will receive beneficial treatment from us.

Now let me conclude my work with the following recommendations.

RECOMMENDATIONS

The following measures are recommended to increase India's engineering exports.

1. There is a need to set up a National Data Collection and Information Centre on overseas trade. The

governmental and nongovernmental trade organisations operating in export promotion must co-operate in this venture. Right type of overseas communication is important for exporters.

2. India has, so long, looked upon the West for exports. But what is needed today is a change and a search for export possibilities in countries of Asia, Africa, Latin America and the Carribean Islands which remained hitherto untapped.

3. Despite liberalisation at the policy level, procedures in many areas still remain archaic and cumbersome. These have to be rectified. Many of the procedures need a thorough review to bring them in line with the emerging economic environment. Regulations and controls have to be minimised. The internal economy has to be freed. This is necessary for competing in the international market.

4. Exports will have to be evolved into a truly high priority national endeavour. A positive export strategy coupled with detailed planning at the micro-level for the products with more export prospects should be formulated to

achieve the growth target of export volume. This is in view of the fact that different commodity groups and different destination countries within each of the commodity groups did not show similar export characteristics. In other words, efforts must be made to evolve a new discriminatory export strategy so that export promotional efforts would become more effective and meaningful.

5. The time is opportune for India to grab the lucrative markets of USA and West Europe, the two major markets which are now looking for alternative import sources as their traditional suppliers viz. Taiwan, South Korea and Japan have become expensive. Therefore market spread is of paramount importance for India's export strategy.

6. Participation in the international trade fairs in a big way, personal contacts and visits to the prospective European clients, America, China, Latin America, Africa etc. and hard-selling approaches to sales are required until a satisfactory image of the Indian engineering items is established. Promotional bodies abroad should be upgraded in terms of quantity and quality of staff and the number of offices in developed world should be increased.

7. Taking advantages of the policy of liberalisation announced by the Government of India 100 per cent export-oriented units should be set up in the Free Trade Zone/Export Processing Zones for producing engineering items in conformity with the international standards and specific requirements of individual importing countries.

Appendix I

EXPORT OPPORTUNITIES IN SELECTED NEIGHBOURING COUNTRIES

COUNTRY	ITEMS
BANGLADESH	Aluminium foils, sheets and circles, railway track materials, MS pipes, tubes and fittings, transmission line towers, electric wires and cables, diesel engines and parts. Jute knitting and textiles mill machinery, tea machinery, electric power generating machinery and railway wagons and components.
SRI LANKA	Auto and auto parts, electric power machinery, sugar mill machinery, sewing machines and parts, machine tools, hoisting machinery and lifts, diesel engines and parts, wire ropes and other wire products, tin plate containers and industrial fasteners.
NEPAL	Agricultural implements, auto and auto parts, storage and dry batteries, electric power machinery, MS pipes, tubes and fittings, rice, dal and flour mill machinery, tractor and parts, sewing machines and parts and other industrial machinery.

AFGHANISTAN	Automobiles and parts, bicycles and parts, cement mixers and concrete vibrators, sewing machines and parts, diesel engines and parts, air compressors and parts, CI products and industrial fasteners.

Source: Arora, D.S. (1991), Engineering Exports: Challenges and Opportunities, Commonwealth Publishers, New Delhi, p.114.

Appendix II

EXPORT OPPORTUNITIES IN SELECTED ASEAN COUNTRIES

COUNTRY	ITEMS
SINGAPORE	Auto and auto parts, bicycles and parts, electric wires and cables, electric fans and parts, electric power machinery, cranes, diesel engines and parts, fabricated steel structures, industrial fasteners, wire ropes and other wire products, stainless steel utensils, castings and forgings.
MALAYSIA	Iron and steel tubes and pipes, aluminium foils, machine tools, hand tools, small tools and cutting tools, agricultural machinery, office machinery and parts, electric power machinery, swtichgears, auto and auto parts, aircrafts and parts, watches and parts, stainless steel utensils, mechanical pumps diesel engines and parts, bicycle and parts and electric fans and parts.
THAILAND	Aluminium utensils, cameras, agricultural machinery, EPNS ware, hand, small and cutting tools, chemical plants, steel furniture, food processing machinery, sugar

	mill machinery, transmission line towers, diesel engine and parts, mechanical pumps, air conditioners, refrigerators, jute and textile machinery, electric power machinery, cinematography and railway coaches and components.
INDONESIA	Hand tools, small tools and cutting tools, transmission line towers, paper and pulp machinery, iron and steel tubes, pipe fittings, diesel engines and parts, auto and auto parts, agricultural machinery, telecommunication equipment, railway coaches, office machines, jute and textile machinery, air conditioners and sewing machine parts.
PHILIPPINES	Auto and auto parts, railway coaches, electric wires and cables, diesel engines and parts, jute, knitting and textile machinery, machine tools, electric power machinery, air conditioners, MS pipes, tubes and fittings, hand, small and cutting tools and transmission line towers.

Source: Arora, D.S. (1991), Engineering Exports: Challenges and Opportunities, Commonwealth Publishers, New Delhi, p.115.

Appendix III

EXPORT OPPORTUNITIES IN SELECTED WEST ASIAN COUNTRIES

COUNTRY	ITEMS
UAE	MS pipes, wire products, CI pipes, electric power machinery, electric wires, cables and accessories, auto parts, machine tools, hand tools, diesel engines and parts, general hardware, sanitary fittings, electrodes, dry and storage batteries, water coolers, aluminium foils, construction machinery, aluminium and stainless steel utensils, oil lamps, bright-steel bars, GI buckets and drums and electric fans.
IRAQ	MS pipes and fittings, steel fabricated structures including transmission line towers, machine tools, railway track materials, steel furniture, tin plate containers, iron and steel castings, bicycle parts, agricultural implements, electrical accessories and appliances, air conditioners, refrigerators, water coolers, electric fans and parts, industrial sewing machines, scientific and surgical instruments, hand tools, industrial fasteners, diesel engines and parts, auto parts, aluminium capsules and closures, cement mixers/vibrators and machanical pumps.

IRAN	Auto and auto parts, bicycles, railway equipment, tractors, agricultural implements, diesel generating sets, diesel engines, pump sets, machine tools, hand, small and cutting tools, welding machines, measuring instruments, steel pipes, tubes and fittings, electric motors, electric wires, conduct pipes, refrigerators and desert coolers, automatic electric irons, heat convertors, hinges and locks, stainless steel utensils and industrial sewing machines.
SAUDI ARABIA	Diesel engines and parts, hand, small and cutting tools, electric fans, aluminium utensils, fabricated steel structures, bright steel bars, MS pipes and tubes, mechanical pumps, electric power machinery, auto and auto parts, air conditioners, refrigerators and steel furniture.
KUWAIT	GI pipes, GI buckets and drums, wire products including wire ropes, electric power machinery, switchgears, electrical accessories and appliances, machine tools, electric wires and cables, auto parts, sanitary water fittings, diesel engines and parts, aluminium and steel utensils, steel furniture and steel trunks.

OMAN	MS pipes and fittings, wire products, steel furniture, CI pipes and fittings, steel fabricated structures, bright bars, auto parts, iron and steel castings, electrical accessories and appliances, electric fans and parts, electric machinery and switchgears, diesel engines and parts, construction machinery and machine tools.
BAHRAIN	Electric wires and cables, electric power machinery, MS pipes and fittings, CI pipes and fittings, steel structures fabricated, wire products including wire ropes, industrial fasteners, electric fans and parts, machine tools, sanitary fittings, general hardware and coastal vessels.
QATAR	MS pipes, CI pipes and fittings, wire products and wire ropes, transmission line towers and poles, electric power machinery, electric wire cables and accessories and appliances, hinger, mechanical pumps, diesel engines and parts, air conditioners and refrigerators.

Source: Arora, D.S. (1991), Engineering Exports: Challenges and Opportunities, Commonwealth Publishers, New Delhi, p.117.

Appendix IV

EXPORT OPPORTUNITIES IN SELECTED AFRICAN COUNTRIES

COUNTRY	ITEMS
NIGERIA	Machinery and transport equipment, commercial vehicles, power generation equipment, agricultural machinery, non-electrical machinery, heating and cooling equipment, pumps, auto and auto parts, metal manufacturers, structures, instruments and apparatus, bicycles and parts, diesel engines and parts, hand, small and cutting tools.
KENYA	Non-electric machinery including heating equipment, mechanical handing equipment, pumps, machinery for special industries, including construction machinery, agricultural machinery, textile and leather machinery, telecommunication equipment, electric power machinery, metal manufactures machine, hand and small tools, office machines and railway vehicles.
TANZANIA	Sugar mill machinery, bicycle and parts, auto and auto parts, machine tools, textile machinery, industrial machinery, electric power machinery, agricultural equipment,

	steel structurals fabricated office machines, telecommunical equipment, railway track equipment, ships and boats.
UGANDA	Commercial vehicles, diesel engines and parts, paper mill machinery, food processing machinery, sugar mill machinery, electric power machinery, agricultural implements, hand, small and cutting tools, water and sanitary fittings, railway wagons and coaches.
ZAMBIA	Auto and auto parts, diesel engines and parts, wire ropes and other wire products, dry and storage batteries, agricultural implements, oil mill machinery and railway trade materials.
ETHIOPIA	Steel pipes, tubes and fittings, diesel engines and parts, jute knitting and textile machinery, electrical accessories and appliances, auto parts, bicycle and parts.
ZIMBABVE	Machinery and transport equipment, auto parts, mining and electrical machinery, edible oil refining plants, food processing machines, power generating sets, hand tools, bicycles and parts, batteries, data processing machines, air conditioners, sewing and printing machines.

LIBYA	Fabricated steel structures, transmission line towers, MS pipes and tubes, boilers and fittings, auto and auto parts, electrical power machinery, electric wires and cables, mechanical pumps, earth moving equipment, diesel engines and parts, electrical appliances and accessories, agricultural machinery, office machines, ships and boats, floating structures, sound recorders and tapes.

Source: Arora, D.S. (1991), Engineering Exports: Challenges and Opportunities, Commonwealth Publishers, New Delhi, p.118.

Appendix V

EXPORT OPPORTUNITIES IN USA AND CANADA

COUNTRY	ITEMS
USA	Hand tools, cutting tools and small tools, carpenters tools, plumbing tools, simple garage equipment and tools, builders hardware, wire nails, door knobs and hinges, fencing materials, garden tools, auto ramps and jack stands, air-pumps, foot and hand, hydraulic jacks, grease guns, hose clamps, fitters and fasteners.
CANADA	Hand tools, small and cutting tools, stainless steel utensils, steel structures (fabricated), CI products, MS pipes, tubes and fittings, builders hardware, cutlery, diesel engines and parts, forgings, mechanical pumps, machine tools, air compressors, sewing machines and parts, office machinery, bicycle and components, electric power machinery, castings and musical instruments.

Source: Arora, D.S. (1991), Engineering Exports: Challenges and Opportunities, Commonwealth Publishers, New Delhi, p.124.

Appendix VI

THE PRODUCT/COUNTRY CATEGORIES HAVING A HIGH, MEDIUM AND LOW POTENTIAL ARE PRESENTED BELOW IN A TABULAR FORM

PRODUCT	Country Potential		
	High	Medium	Low
Hand Tools	--	--	Spain
Diesel Engines	FRG, France	UK, Italy Belgium	Spain
Machine Tools	--	Italy	Netherlands Spain
Pumps	--	Netherlands	Belgium, Spain
Nuts & Bolts	France	UK, Netherlands	Italy, Spain
Textile/Leather Machinery	Italy, France	UK, FRG	Belgium, Spain
Wire Ropes	FRG, France	Netherlands	Italy, Belgium Spain
Castings	Belgium, France	Netherlands	Italy
Pipes & Tubes	FRG France	UK, Netherlands France	Italy
Plumbing/Heating Lighting Equipment	FRG, France	UK, Netherlands	Italy, Belgium, Spain

Source: Export Import Bank of India, Occasional Paper No.6, 1989, June, p.24.

Appendix VII

NEW PRODUCTS/MARKETS IDENTIFIED FOR ENTRY ARE

Diesel Engines	Italy, Belgium, Span
Machine Tools	Spain
Pumps	Netherlands, Belgium, Spain
Nuts and Bolts	France, Spain
Textile/Leather Machinery	Italy, Belgium
Wire Ropes	Italy, Netherlands, Belgium, France, Spain
Costings	Italy, Netherlands, Belgium, France
Pipes & Tubes	Italy, Netherlands, France
Plumbing/Heating/ Lighting equipment	Italy

Source: Export Import Bank of India, Occasional Paper No.6, 1989, June, p.25.

Appendix VIII

EXPORT OPPORTUNITIES IN SELECTED WEST EUROPE COUNTRIES

COUNTRY	ITEMS
UNITED KINGDOM	Garden tools, optical instruments, surgical instruments, electronic components, hand and cutting tools, machine tools, electric power machinery, air compressors, mechanical pumps, industrial fasteners, ferrous castings, agricultural implements, builders' hardware, electrical appliances and accessories and bicycle and parts.
GERMANY	Steel and flangs and bends, metal containers, stranded wires, cables, ropes, builders' hardware, wood screws, domestic articles of stainless steel other than table use, aluminium foils, garden tools and implements, mechanical pumps, refrigerators, sewing machines and parts, machine tools, wood working machines, electronic equipment, electric switchgears, bicycles, and components, diesel engines and parts, scientific and surgical instruments.
FRANCE	Diesel engines and parts, steel flanges, metal containers, industrial fasteners,

mechanical pumps, refrigerators, machine tools, electronic calculating machines, builder's hardware, hand tools, primary cells and batteries, electrical appliances, electrical switchgears, auto parts, bicycle and parts, scientific and surgical instruments, air-compressors and tinplate containers.

Source: Arora, D.S. (1991), Engineering Exports: Challenges and Opportunities, Commonwealth Publishers, New Delhi, p.122.

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