CHAPTER - I

INTRODUCTION

Electronics industry represents a small, but - judged by potentialities - a relatively promising industrial sector within India's national economy. In 1979-80, for instance, while manufacturing, as a whole, contributed around 18 percent of the country's gross domestic product, value of output of electronics industry at current prices was still less than even one percent of the latter. Nevertheless, the industry in this country has been drawing increasing attention from planners and policy-makers. Growth of electronics industry has repeatedly been emphasized during the past two decades - initially for self-reliance and import-substitution, and lately as a vehicle for promoting exports.

1In 1979-80, India's gross domestic product (GDP) at factor cost - valued at current prices - was estimated as Rs. 94978 crores. The total contribution of the secondary sector towards GDP was Rs. 23313 crores, while the contribution of manufacturing - considered alone - was Rs. 16952 crores (i.e. 17.8 percent of GDP). The contributions towards GDP from agriculture (including forestry, fishing and mining) and from services in that year were 38 percent and 37 percent respectively. See Government of India, Central Statistical Organisation, Basic Statistics Relating to the Indian Economy 1984, Delhi : Controller of Publications, 1985, P- 16.

2In 1979-80, the value of output of electronics industry in India at current prices was estimated as Rs. 668'9 crores. See : Government of India, Department of Electronics, Annual Report 1980-81.
The actual growth of electronics industry in India has also been 'impressive' from a number of angles. Throughout the 1960s and 1970s, production of electronic equipments and components had grown at a rate which was well above the country's average industrial growth rate. There had been substantial widening in the production-base, and ability acquired to produce within the country a wide range of electronic products, comprising components, equipments and systems. In sharp contrast to the situation prevailing in the 1940s or 1950s when the industry in this country used to mean primarily the assembly of radio receiver sets by a few private-sector firms, by late 1970s it was practically difficult to find an area within the country's economy - be it the defence, communication, space, nuclear research, power, industry, mining or the media - where electronics had not permeated in some form or the other.

The genesis of the above development is interesting. While much of the growing importance of electronics in the national scene can be traced to the technological innovations in the developed countries and to their 'demonstration effects', certain

3 The details regarding the growth of electronics industry in India are presented in chapter II (PP-16-50) and Chapter III (PP. 51-90) in this study.


Nurkse (1953) had discussed, though in a different context, the role played by 'demonstration effect' on an international plane in shaping the consumption-pattern and priorities in the developing countries. See Ragnar Nurkse, *Problems of Capital Formation in Underdeveloped Countries*, Oxford : Oxford University Press, 1953 PP. 61-85.
important developments concerning the direction of (i) the national economy, and (ii) the official policy-framework, also played no less decisive role in this regard. In the remaining part of the present chapter, we shall attempt to have an overview of these developments. To start with, the continuous technological innovations in the developed countries did open up possibilities for wide application of electronics technology in strategically important sectors (like defence, space, and atomic energy) and in many other sectors of national importance (like telecommunication, the media, generation and distribution of power, mining, industry and others).

The heavy Central Government investment in all the above sectors through the successive five-year Plans and the galloping rise in defence expenditure in mid-1960s following the military conflicts with China (in 1962) and Pakistan (in 1965) created considerable demand for electronic equipments. The burgeoning import-bill in the face of an uneasy foreign

---


The rise in defence expenditure of the above magnitude led to substantial increase in demand for electronic equipments and systems. For instance, the Bhabha Committee Report, which was submitted in 1966, estimated that defence equipments alone would "account for half of the total demand for electronic equipment over the next years". cf., Government of India, Electronics Committee, Electronics in India (Bhabha Committee Report), Bombay: 1966, P. 2.
exchange situation, combined with certain strategic and technological considerations, thus, served to bring the industry within the focus of official attention.

Since mid-sixties, two other broad trends within the national economy were also notable. First, the wide-spread industrial recession which struck the Indian economy since the mid-1960s could not affect the consumer durables sector. As A.K. Bagchi noted:

Even while the markets for traditional consumer goods industries were becoming saturated, new consumer goods industries catering to the needs of the richer sections of the population were growing up. Since the mid-sixties the relative importance of the markets for luxury consumer durables have increased, and this is reflected in the rate of growth of output of consumer durables.

---

6 See in this connection, the Government of India resolution (dated, August 12, 1963) setting up the Electronics Committee under the Chairmanship of Dr. H.J. Bhabha - as quoted in Government of India, Electronics Committee, Electronics in India, op. cit., pp. 4-8. Also see, the various arguments put forward by the Electronics Committee (in Ibid, pp 9-16) for emphasizing the need to build-up within the country a self-reliant electronics industry.


The paradox, as noted by Bagchi and which has been corroborated by other researchers, can be explained only in terms of the persistent income—inequalities among different sections of people. The development strategy pursued during the five-year Plans failed to reduce, if not accentuated, the inequalities in the distribution of income. While the masses at the bottom remained poverty-stricken, at the upper slabs of income there was considerable and growing consumer expenditure, particularly on durable—among which were included radio-receiver and T.V. sets, tape recorders, record-players and sundry other entertainment electronic products.

---


10 On occasions, there have been admissions from government circles of the persistent inequalities in the distribution of income and wealth. See, for instance: Government of India, Planning Commission, Sixth Five Year Plan 1980-85, New Delhi : 1981, pp. 7-9.

11 In fact, as Nayyar (1978) has observed, a large number of government policies (like the reduction of indirect taxes on luxury goods, a substantial cut back in income taxes payable by the rich, among others) had been directed towards stimulating the consumption of the higher income groups. Cf. : Deepak Nayyar, "Industrial Development in India: Some Reflections on Growth and Stagnation", op. cit., p. 1275.
A second notable feature of the industrial scene was the latent trend towards automation. The period since mid-Sixties, as noted earlier, had been marked by a phenomenon of persistent industrial stagnation. The same period had also seen, among others, a continuously rising capital-output ratio. The two phenomena, probably cannot be considered in isolation and, as many researchers have pointed out, the two, in fact, were inter-related. Other considerations apart, all available evidences suggested that there had been increasing preference in industry for capital-intensive techniques, and a resultant surge in demand for computers and various electronically-controlled capital goods in industry could be noticed.

---


13 Nirmal Kumar Chandra, "Long Term Stagnation in the Indian Economy, 1900-75", op.cit., PP. 552-554.

14 Sudipto Mundle, "Growth, Disparity and Capital Reorganisation in Indian Economy: Some Speculations", Economic and Political Weekly, Vol. XVI Nos. 10, 11 & 12, (Annual Number, March 1981), PP. 397-401. (Mundle, however, did not elaborate whether the shift "to capital intensive industries and to more capital intensive techniques within industries" was because of deliberate policies pursued by Indian industrialists, or it simply resulted from indiscriminate import of technology and capital goods from advanced countries.)

Against the backdrop outlined above, the home demand for electronic products—strategic, entertainment and industrial—had been growing steadily and significantly over time; and, within an overall framework favouring import-substitution in whatsoever form, the possibilities that were thus opened up for substituting imports provided the stimulus for undertaking, expanding or encouraging local manufacture of electronic equipments and components.

In the 1970s, electronics industry also drew attention of the Indian policy-makers from a somewhat different angle. Many developing countries during the sixties and seventies, because of unfavourable terms of trade for most of their traditional exports, and also for a variety of other reasons, had increasingly been emphasizing the export-production of 'non-traditional' manufactures. In India, this trend could be discernible since the early-Sixties in the context of the severe foreign exchange crisis experienced during the implementation phase of the Second Five Year Plan; it received major thrust in mid-sixties when the Government

---


17. It is argued that a suitable strategy for the promotion of non-traditional exports can help the developing countries to overcome some of their most serious problems, such as excessive fluctuation in export income, possible deterioration of the terms of trade, smallness of the domestic market with its consequent unfavourable effect on the efficiency of industrial activities, and chronic shortages of external resources. For a summary of the dispute concerning 'expert-led growth', see G.K. Helleiner, International Trade and Economic Development. Middle sex: Penguin Books, 1972, PP. 15-32.
initiated a package of economic reforms consisting of the devaluation of the rupee in 1966 and found further consolidation since early-seventies when the rise in prices of oil, inter alia, further aggravated the foreign exchange situation. At macro-level, the initial optimism in policy-makers with regard to import-substituting industrialisation was fast approaching its limits, and arguments were being put forward from several quarters ascribing the slow-down in overall industrial growth to the inefficiencies and 'wastes' of the process of import-substitution. This line of argument, which on the prescriptive side often called for suitably re-adjusting trade policies on the basis of the country's 'comparative advantage' and undertaking of 'production for exports', was gradually finding wide acceptance within the Government. The 1970s, in fact, witnessed remarkable

---


20 Sunanda Sen, "From Import Substitution to Export Promotion: Policy Planning in India's Foreign Trade Sector", op. cit., P. 630.
policy-shift in favour of 'outward-looking industrialisation.' Much of the growing emphasis placed upon the growth of electronics industry in recent years can be viewed as a sequel to the gradual shift in the premises of India's industrialisation strategy from import-substitution to export-promotion.

For electronics, in particular, the factor which served to draw the notice of policy-makers to this field was its generally-held 'labour-intensive' character of production. Exorbitant labour cost in developed market-economies, combined with the labour-intensive character of production in different segments of the electronics industry had created conditions for international subcontracting inducing, thereby, many multinational enterprises in the 1960s and in 1970s to relocate part of their production process from the developed countries to the less-developed ones. Quite a few of the less-developed countries in South-East Asia and in some other parts


23 Although there are other industries where production in developing countries to feed developed country markets has been set up, e.g., cameras and garments, cases of "tied feeder plants" have been most dramatic in the electronics industry. See : UNCTAD, Electronics in Developing Countries : Issues in Transfer and Development of technology, United Nations, 1978, (TD/B/C.8/34), P. 18 ; Also see : UNCTAD, International Sub contracting Arrangements in Electronics between Developed Market Economy Countries and Developing Countries, (TD/B/C.2/144), 1975, P - 2.
of the world, were quick to capture this opportunity of new 'international division of labour'. Their open-door policy to the multinational corporations, close geographical, commercial and, sometimes political, links with the industrially advanced countries, the ability to supply cheap labour, and liberalised import regimes, inter alia, enabled these countries to bag lucrative returns from electronics in favour of their export-led growth strategy.24

The apparent success of these countries had its influence on other developing countries as well, India being no exception. The establishment near Bombay, in 1973, of an export-processing zone exclusively for electronics, and the introduction during the seventies of a variety of schemes to boost electronics exports bear testimony to this.28


However, recent studies focussing on the technological trends in electronics industry have cast serious doubts on the 'real gains' that can be derived from export-oriented manufacturing in electronics industry and the validity of such a strategy for other developing countries that are relatively late comer to the process of export-led growth. For instance, See: Dieter Ernst, "Automation, Employment and Third World: Case of Electronics Industry", Economic and Political Weekly, Vol. XXI, No. 28 (July 12, 1986), pp. 1213 - 1223.

25 For detailed discussion on this point, see Chapter VII of the present study, pp.
The Present Study

In the context outlined above of the growing importance of electronics industry in the national scene, the present study undertakes a review of the past pattern of growth of the industry in this country. The two important and explicit expectations behind emphasizing the growth of electronics industry were as follows:

(i) The growth of the industry would have catalysing effect on the overall economic and industrial development through its linkage effects on other sectors; and

(ii) the principal direct effects of growth would be in the form of substantial employment and foreign exchange benefits (through substitution of imports or through exports), in the immediate future, and acquisition of technological self-reliance in the long run.

Though the range and value of electronics output in India have grown significantly over time, evidences show that the above expectations have remained, to a large extent, unfulfilled.

The present study attempts to advance certain possible

---

26 See the text of the Government of India Resolutions for setting up the Bhabha Committee in 1963 and, later, for setting up the Electronics Commission in 1971. The resolutions were quoted in - Government of India, Electronics Commission, Electronics in India, op. cit., pp. 4-8; and in, Government of India, Electronics Commission, Perspective Report on Electronics in India, June 1975, p. 40.

Also see in this connection, Chapter II in Perspective Report on Electronics in India, op. cit, pp. 71-104.
explanations for the above-mentioned failure, on the basis of available empirical evidences. It analyses, with reference to the role played by the Government, the way in which electronics industry has grown in this country and identifies the principal factors at the micro level that have retarded the growth of the industry in the past.

**Choice of period.** While analysing the growth-experience of electronics industry in this country, the study focusses on the post-independence period in general, and on the decade of 1970s in particular. The context at the micro-level and also the macro-considerations that prompted the choice of period need to be spelt out at the outset.

Till the early part of the sixties, electronics industry in this country was in its nascent stage, the narrow production base remaining the virtual monopoly of a handful of public and private-sector firms. Need for building up within the country a sound base for electronics production was first felt in the wake of submission of the famous Bhabha Committee Report in 1966. However, Government's resolve to steer the growth of electronics industry'in an integrated manner' was taken only in 1971 when the Electronics Commission was finally set up.  

---


The setting up of the Electronics Commission, however, was preceded by the constitution of a separate Department of Electronics with effect from 26th June, 1970.
Prior to the setting up of the Electronics Commission, there was no apex body to monitor the growth of electronics industry; production activities were uncoordinated and widely dispersed under various agencies. Moreover, a complete industrial classification for electronics industry was yet to take its shape, and ambiguity in classification often seriously restricted the reliability of data. One of the responsibilities assigned to the Electronics Commission, when it was set up, was arranging collection and dissemination of information relating to the various aspects of the industry's operation on a regular and systematic basis.\textsuperscript{29} To discharge this function effectively, the Information, Planning and Analysis Group (IPAG) was set up within the Electronics Commission. Thus, data, on a fairly detailed level of disaggregation, covering different aspects of the growth of electronics industry in India were available regularly only since the early part of 1970s.

At macro level, the decade 1970s makes an interesting reading for more than one reason. First, the period continued to witness a phenomenon of persistent industrial stagnation with marked and significant slow down in growth for a substantial part of the industrial sector. The government, caught between the problems of stagnation on the one hand, and its incapacity to enforce effectively the regulatory and other devices to channelise growth along the desired directions on the

other, opted increasingly in favour of liberalisation of controls and progressive opening-up of the economy to foreign capital and technology. The basic premise of India's industrialisation strategy experienced during the 1970s remarkable shift in its basis from import-substitution towards export-led growth. As has been pointed out earlier in this chapter, the importance of electronics industry in India was increasing partly as a sequel to these policy-changes. An in-depth study of the growth experience of the industry covering such a period of transformation is likely to throw useful light on some of the underlying assumptions inherent in the shift in policy-premises. The conclusions drawn in this study, however, are related, essentially, to the electronics industry's specific growth-experience, and no attempt has been made to generalise these at the macro-level.

Frame of the Study. The present study is divided into a total of eight chapters. (Apart from the on-going one, there would be another seven).

Chapter II, which follows, undertakes a brief review of the growth of electronics industry in India prior to 1971. The chapter points to some of the basic weaknesses within the industry's structure that were 'in-built' since the early phases of growth and that persisted through

subsequent periods. Discussion in chapter II, in fact, provides the broad context against which growth during the 1970s can be appropriately measured and evaluated.

Chapter III presents a statistical overview of the growth of electronics industry during 1971-1979. The unsatisfactory performance of the electronics industry in India and the industry's slow growth are brought out through the use of specific performance-criteria.

Chapter IV, Chapter V and Chapter VI examine, in the context of electronics industry, different aspects of India's industrialisation strategy and attempts to advance the possible explanations for the slow growth of the industry during the period under consideration. The role of import-substitution, nature of formulation and implementation of sectoral growth-plans, the overall policy-framework, and the continued technological dependence on developed country firms - are investigated in detail to assess how they had affected, in the past, the pace and pattern of growth of electronics industry in this country.

Chapter VII discusses the gradual policy-shift in favour of 'outward-looking industrialisation' in the context of the electronics industry and attempts an analysis of the experiences in Santacruz Electronics Export Processing Zone (SEEPZ).

Chapter VIII, the last in this study, presents a summary of earlier observations and certain concluding remarks.