DRAINS AND GAINS THROUGH INTERNATIONAL MIGRATION OF TRAINED MANPOWER: THE INDIAN CASE WITH A STUDY OF MIGRATING IIT GRADUATES

Thesis submitted to the Jawaharlal Nehru University in fulfilment of the requirements for the award of the Degree of

DOCTOR OF PHILOSOPHY

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July 27th, 1994

DECLARATION

Certified that the thesis entitled "DRAINS AND GAINS THROUGH INTERNATIONAL MIGRATION OF TRAINED MANPOWER : THE MIGRATING IIT GRADUATES" submitted by Ms. JYOTSNA JHA in fulfilment of the requirement for the award of the degree of DOCTOR OF PHILOSOPHY, has not been previously submitted for any other degree of this or any other University and is her own work.

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ACKNOWLEDGEMENTS

I would certainly like to avail this opportunity to express my gratitude to all those who extended all sorts of help, support and encouragement in the process of doing my doctoral work.

First of all, I am extremely grateful to my supervisor, Prof. Tapas Majumdar for his active guidance and encouragement at all stages of work. I must acknowledge that working with him has been a wonderful experience which has enriched my knowledge of Economics. I feel privileged to have this opportunity to work with him.

I am thankful to Prof. S.C.Ghosh, for being my official supervisor.

I am also very thankful to Prof. Narinder Singh and other faculty members of the centre including Prof. Karuna Chanana, Prof. Sushila Singhal and Dr. Geetha B. Singh for their concern and encouragement.

Dr. Binod Khadria of Management Development Institute, Gurgaon deserves a special mention as he not only made himself readily available, but also took the pain of going through parts of my thesis and made valuable comments and suggestions. I am also grateful to Prof. Deepak Nayyar for making the manuscript of his book available to me and to Prof. C.S. Jha for making certain reports available to me, which were otherwise not accessible.

I acknowledge the co-operation extended to me by Prof. Sukhatme of IIT, Bombay and Prof. Natarajan of IIT, Madras in sending the list of migrants. Thanks are also due to all those migrants who took time off from their busy schedules to reply to my questionnaires. Without the cooperation of these respondents, the study could not have been complete in the present shape.

I am thankful to Librarians and staff of Jawaharlal Nehru University Library, New Delhi, Institute of Applied Manpower Research Library, New Delhi, Council of Scientific and Industrial Research Library, NEw Delhi, Department of Science and Technology Library, New Delhi, American Centre Library, New Delhi, National Institute of Public Finance and Policy LIbrary, New Delhi, Indian Institute of Technology Library, New Delhi, Central Secretariat Library, New Delhi and India Investment Centre Library, New Dehi. Thanks are also due to some of the officials of India Investment Centre who made some unpublished data from Reserve Bank of India available to me.

No Ph.D. thesis can be complete without emotional support and encouragement, which I received amply from my family and friends. Words cannot express my gratitude towards my parents who have always been a source of strength for me. My sister, Vandana and my brother-in-law, Anil, have been very helpful all through my stay in Delhi. Archana, my other sister, made my stay in Delhi much more enjoyable and provided all sorts of help. My nephews, Ankur and Akshat, have been sheer delight to me. My brother Avinash and Sister-in-law, Anuradha, have been very encouraging.

I am also extremely grateful to Mrs. Gauri Majumdar, who with her affection and care provided me a home away from home.

Friends have been a great asset in my life, who provided all help and support during these long years of my stay away from home. I am grateful to Ritu, Meera, Vineeta, Bulu, Sanjeev, Rakesh, Sujit, Vidya, Satish, Radha, Madhura, Mamta, Seema, Sudha and Mithilesh for thier friendship and care. Some of them actively helped me, some of them were always there to give enjoyable company, some of them encouraged me through letters and some proved a source of strength just by being there!

I have received help from so many people at different stages that is is not possible to mention all names here. To put it differently, the list is only indicative and not exhaustive! However, I am thankful to all of them. I must thank Mr. P.V.S.Lakshminarayana for typing the thesis with care.

Finally, I must mention here, that I am myself responsible for any omission or error in the work.

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CHAPTER I

INTRODUCTION

DRAINS AND GAINS

During the last phase of British period in India, a base for the development of higher education system in Sciences including medicine and engineering was created. This was broadened and strengthened in the early post independence period so that the country could produce enough scientific manpower needed for its development. At the same time developed countries were also expanding their economies and suffered from shortage of highly qualified manpower(hqm). Due to widely different levels of growth, these developed countries could offer much higher price to these hqm and in the process India, along with several other developing countries, became an important source of supplying hqm to these countries. This phenomenon which is more commonly known as "brain-drain" from developing countries to developed countries - implying a loss to the former and benefit to the latter, generated a lot of interest and discussion among scholors including economists during 1960s and 70s. The main focus of the discussion was, to begin with, either on explanations for occurrence of the phenomenon or on the losses associated with brain drain for the emigrating country.. However,since the phenomenon involves drain of not only brain but also of other resources, for example, expenditure on education of emigrating HQM it is preferable to discuss the types of associated drains as well. By 1980s, this no more remained as much discussed a topic when a new line of thought also developed which pointed out to the gains associated for the Less Developed Countries(LDCs), especially in terms of financial inflows and added training of returned migrants. During 1990s, the whole phenomenon of international migration of highly qualified manpower (HQM) needs a re-examination in the changed perspective with the changing economic policy and a more matured education system. This study has been conceived and developed to fulfill that need.

1.1 SCOPE : International migration of Indians during the post-independent period has not been limited to hqm only. Large number of skilled, semi-skilled and unskilled workers migrate to middle-east countries

of the Gulf which are fast growing, oil exporting economies. Though quite significant in several senses this kind of migration cannot be clubbed together with that of the hqm as they widely vary in certain aspects. The present study is limited to discussion of the issue in the light of HQM migration only.

Along withe the discussion of the phenomenon as a whole, the study is also specifically related to emigration of hqm from Indian Institutes of Technology (IIT) and as such, is more significant for engineers and scientists. However, the conclusions specific to IITs, can also be extended to other institutions experiencing high rates of emigration. Here it must be emphasised that IIT is only a surrogate to the main study. The main reason for concentrating on migration from IITs is that they are typical of the situation with high cost education and high level of migration in the context of brain drain studies. It was, therefore, thought that focussing on IITs might be representative of the more important part of the loss of HQM through migration from India.

1.2 **OBJECTIVES OF THE STUDY:** The objectives of the present study can be outlined as follows -

(a) to see how far the demand forces working in the developed countries contribute to the occurrence of this phenomenon of international migration of hqm.

(b) to examine and analyze the Indian Government's response towards the phenomenon as shown in policies and programmes relating to issues associated with international migration of hqm;

(c) to trace and analyze the trends as discernible in various flows through emigrating hqm at financial and human capital levels;

(d) to examine all the above parameters in the context of migration from Indian Institutes of Technology(IIT) while associating these to objectives and costs of IIT education;

(e) to examine the issues also in context of the role played by foreign aid taken for the establishment of IITs; and

(f) lastly, on the basis of above analysis, make certain policy suggestions with implications for issues related with hqm migration in general and IIT migration in particular.

1.3 **DATABASE AND METHODOLOGY** : The stuoy deals with various aspects of the issue of international migration of hqm and hence information on wide-ranging fields were required. Besides, information had to be collected at various levels from two economies, India and the United States, the main destination of scientists and engineers. As such, severe limitations were faced in the process.

Both primary and secondary sources have been used for data collection. At macro level, as far as possible, official published sources have been used but since database is not systematic and public at some levels, other sources had to be resorted to. For Indian Institutes of Technology, various reports and documents, published by the Indian Government were used. For certain aspects like comparison of IITs with other Science & Technology institutions, secondary sources were resorted to. For data relating to macro level financial and human capital inflows reports by various departments and bodies of the Government of India, dealing as nodal agencies in these areas, have been used as main source. Some unpublished data from authentic source like Reserve Bank of India have also been included.

For data relating to American economy at macro level, official published sources have been used. However, some of that information that had to be taken from secondary published sources on most occasions, as various reports and documents are either not available or not accessible here in India. Since the data come from original official sources and are sufficient to show the trends for relevant period, they serve the purpose of analysis.

DATA INPUT OF SURVEY OF IIT MIGRANTS:

In addition to the published data used in the study, a survey was conducted on IIT migrants during 1991-1993, who were living in foreign countries and had migrated between 1968 and 1985 Since the emphasis of the present work is on those who join work force in foreign countries and live there for long periods, the migrants who had left the country recently were not included.(See Appendix I for methodology and Appendix II for questionnaires of this survey). Altogether, information provided by 110 respondents were presented in tabular forms and some of them were put against macro-level published data in order to examine the trends.

Another dimension has been sought to be added to the data in the study by using the insights from a number of case-studies undertaken with the help of information provided by some of the IIT migrants now living abroad. These case-studies have provided deep insight into areas which would have remained unexplored. With the help of this survey along with the macro level evidences, certain important conclusions have been derived. Certain solutions have been suggested with pragmatic approach. On account of this experimenting with a mixed methodology of setting macro level official statistics against individual anecdotal accounts of the case studies, the usual types of statistical test have not been made in the study.

1.4 PLAN OF THE STUDY : The whole study has been divided into eight chapters, as follows -

(i) Introduction. This is the present chapter which includes objectives, scope, data base and methodology, chapterization, historical background, research questions and hypotheses.

(ii) Chapter II relates to critical survey of literature relating to issue of brain drain. The chapter has been divided into two parts, one dealing with the literature on various aspects of international migration of HQM and the other dealing specifically with literature on IIT migra-

tion.

(iii) The third chapter analyses the establishment and growth of IITs in the light of the various policies of Indian Government relating to science, technology and industry and the chosen strategies of development. The chapter includes an analysis of the costs of education in IITs as well as a detailed analysis of the role of foreign aid in view of the various conditions attached and high rate of migration of their graduates to developed countries. Attributes of IIT migrants, as interpreted from the survey have also been added to this chapter.

(iv) Chapter IV discusses the demand side of the phenomenon of HQM migration. Since the United States(US) has been the main destination of emigrating Indian HQM, the US Immigration Policy and labour market trends including occupational category's growth and requirements have been analyzed.

(v) Chapter V deals with the position of the Indians in the US economy as revealed by various official documents and surveys. The position of IIT migrants and their experiences in the US have also been included. Certain detailed cases of IIT migrants have been prepared so as to identify their links, if any, with Indian economy and also to have insight into associated problems and prospects.

(vi) Chapter VI analyses the Indian policies towards migrating HQM in relation to financial flows. The trends as observed in financial flows originating through these Non Resident Indians(NRIs) have been identified and analyzed in detail. The analysis of financial inflows coming through IIT migrants has also been included.

(vii) This Chapter deals with Indian policies towards human capital aspects of migrating HQM and also

discusses the trends in inflow of human capital content through Non Resident Indians. The analysis has taken the shape of examination of various existing schemes as well as of the responses of IIT migrants in this regard.

(viii) This last Chapter summarizes the whole study and outlines the conclusions that have emerged from the whole analysis. Certain solutions have been also suggested with a view to minimize the losses related with HQM migration for Indian economy. Some of the suggestions are specifically related to IITs but at the same time are extendable to other institutes as well. Other suggestions have policy implications for general HQM migration and related issues.

1.5 HISTORICAL BACKGROUND

Even during the pre-independence period for centuries, India had experienced the emigration of its people to various countries of Africa and Asia - mainly colonies of European countries, for the purpose of serving as labourers chiefly in agricultural plantation and also in mines. This had not affected the Indian economy of the period in any significant manner. In post-independence period, however, this took a new turn when both the quality of emigrating people in terms of skills and countries of destination changed, giving the phenomenon a different colour. The new emigrants were highly trained and qualified doctors, engineers, scientist and other professionals. The United Kingdom having special commonwealth ties was the main country of destination in the 1950s for Indian emigrating HQM. Since mid sixties, however, North America including both the United States and Canada, became more important direction for Indian emigrating HQM (See Table A.1 in Appendix II). A small percentage of HQM, however, also migrated to Australia and some countries of Western Europe. In the beginning, when emigration was directed more towards U.K., doctors were main components, but since 1960s the relative share of engineers and scientists

has increased, especially for those migrating towards the United States and Canada. A study by Institute of Applied Manpower Research (IAMR Report No.4/1970) doing an analysis of ordinary passports during as early as 1960-67 shows that the engineers constituted the single largest group among all the professionals either taken as a whole or taken separately for different purposes such as study, employment, training and emigration. Well above half of the passport holders intending to emigrate were engineers. The continued trends in emigration of engineers and scientists make it worth looking at the phenomenon with special reference to scientific and technical personnel.

The importance of science and technology education for any country becomes evident with realisation of potential contribution of such education to development objectives. Technical education is viewed as a key input in the industrial growth and economic development of a nation. Modern techniques of production and distribution require manpower with modern know-how, innovative aptitude and technical excellence. The education system prepares persons with such knowledge and assumes special interest for the planners and policy makers. Establishing a chain of Indian Institutes of Technology at Kharagpur, Madras, Bombay, Kanpur and Delhi as institutes of national importance was an endeavor in this direction. A question has often been raised regarding the contribution of IITs towards country's development efforts in view of high rate of emigration and associated losses. Two types of losses are involved with emigration of educated manpower for the sending country (i) heavy monetary investment, including large subsidies, made on the education and training of migrating people, and (ii) fall in supply of educated manpower for development needs of the country.

The present study attempts to look at the whole phenomenon from the point of view of associated flows, both financial and human capital, and analyze the related policies and trends. Some primary evidences suggest that people who emigrate do not cut off their relationship with India totally - main-

taining some link either through finances or through use of their 'brain' or at times both. The introduction of a number of detailed schemes seeking involvement of NRIs for financial investment also makes it relevant to examine the trends in the area. Hence, the present study takes up the issue of international migration of HQM in a different light and tries to suggest certain policy implications as revealed by the analysis.

1.6 RESEARCH QUESTIONS: The research questions before this study are as follows: (i) What has been the role and share of social costs in IIT education, (ii) Are the amounts and share of social cost so high that the establishment of IITs can be questioned in view of high rates of migration; (iii) What has been the role of foreign aid in the development of IITs and in the larger context of Indian economy in view of high rates of migration abroad by IIT graduates; (iv) To what extent the policies and forces working at the demand side - the countries of immigration determine the size and nature of migration; (v) How do emigrating Indian HQM perform in their countries of destination; (vi) Do emigrating Indian HQM severe all their links with Indian economy; (vii) What has been the Indian Government's response towards migrating HQM; (viii) Are the policies relating to the issues associated with HQM migration sufficient and in the desired direction, (ix) What have been the trends in the various inflows viz., financial and human capital - associated with emigrating HQM; (x) Are these inflows sufficient to compensate the losses associated with HQM migration; (xi) Do these inflows involve any price or cost which might outweigh the worth of these; and (xi) What can be the ways for maximising the gains and minimizing the losses associated with HQM migration.

1.7 HYPOTHESES: Based on the research questions, following eight hypotheses have been formed:

(i) The share of social costs is very high in IITs which makes the loss associated with migration of their HQM even higher.

(ii) The establishment and growth of IITs with the help of foreign aid was a right decision for the sake of country's development in the long run, despite high rates of international migration.

(iii) Given the different levels of development between the developed and developing countries and resultant differentials in income and living standards, the demand side policies and forces are the main factor which determine the size and nature of immigrating manpower.

(iv) Emigrating Indian HQM can compete with their counterparts in the international market and are one of the best set of manpower available in the world market.

(v) Emigrating Indian HQM want to develop some links with Indian economy.

(vi) Emigrating Indian HQM are usually a loss as far as use of their education and training for the country's development is concerned.

(vii) Emigrating Indian HQM are important source of capital flows from abroad but a poor supplier of remittances.

(viii) The Indian policy response to the issues relating to HQM emigration has been inadequate and not guided towards right direction.

In the last chapter, certain conclusions, on the basis of the examination of these hypotheses have been attempted. As explained earlier, the methodology used in the study has been mixed in the sense that the available statistics obtained were from different sources including anecdotal accounts in the fifteen case-studies information supplied by 110 respondents. This is in our opinion has added to the insight into the motivations and the working of the supply and demand forces. Due to this use of mixed methodology, however, usual test of hypothesis could not be meaningfully applied and hence they were not used.

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CHAPTER II

INTERNATIONAL MIGRATION OF TRAINED MANPOWER : A CRITICAL SURVEY OF LITERATURE

There is no dearth of literature on the topic of international migration of trained manpower, more commonly known as brain drain. The catch phrase was coined in a 1962 report by the British Royal Society, which enquired into the emigration of engineers, scientists and technicians from the Great Britain to North America. The concept of brain drain, i.e, large scale emigration of high level manpower from developing countries to developed countries or from one developed nation to the other, is directly related to the concept of human capital as the phrase essentially signifies the loss of resources involved in the education and training of emigrating manpower and the saving of the same by the receiving country. The sixties and the seventies were full of debate and discussions on issue whereas the 1980s, as evident in the literature, witnessed a weakening of interest in brain drain debate especially in the developed countries. The reason perhaps lay in the declining rate of emigration from Europe to the US - the prime factor that had triggered the debate. In 1950s and early 1960s, doctors, engineers and scientists emigrated to America in large numbers from Western Europe - obviously attracted by better opportunities available in the wake of large scale expenditure on development and research. This, in turn, paved the way for large immigration of Asian scientific and technical personnel, especially doctors, into Western European countries particularly in the UK and Australia. Since the late 60s, however, the emigration of highly qualified manpower (HQM) from Europe has slowed down significantly and hence the issue of brain drain stopped attracting the same fervour. However, it very much remained an area of concern for less developed countries (LDCs) as emigration of HQM continued from these countries, though the main destination, of course, having been shifted from Europe to the US. With scarcity of resources and needs of development, brain drain from the LDCs have far more severe implications for their economy and that has been present in the literature in various forms. The focus of the literature has been varied - determination

of extent, magnitude and direction of the migration, theoretical explanations and conceptualisation of the phenomenon, the welfare effects of the transfer on the sending and receiving countries, causes of migration mostly in terms of push and pull factors and policy implications and suggestions to make the transfer of human resources more equal. Part I of this chapter surveys the general literature available whereas the second part deals with some specific studies relating to brain drain of IIT graduates.

2.1 THE GENERAL LITERATURE RELATING TO BRAIN-DRAIN :

Though it is not easy to determine the exact number of HQM migration across countries, a good number of studies attempted to establish this, especially for the period of late 1960s and 1970s, mainly carried out by international agencies like UNCTAD, UNITAR, UNESCO and the World Bank. A brief reference to the findings of such studies is being made here as it helps in determining the phenomenon itself. They also give ideas about the main receiving and sending countries. UNCTAD V reported that 73000 scientists, engineers and doctors and other skilled personnel migrated to the US between 1963-72 of which 52000 were from Asia and 13000 from Latin America. During the same period, 38000 high level manpower migrated to Canada, of which, 20000 were Asians. Of 60000 HQM migrated to the UK during this period 60 percent belonged to Asia and Africa. The definition of HQM, however, was broader than what is generally taken as it also included teachers and nurses along with scientists, engineers and doctors.

Almost all the studies make it clear that the US has been the main destination of emigrating HQM from the LDCs since 1960s - the period with which this study is mainly concerned. World Development Report, 1984, shows that 50 percent of five lacs of professional and technical emigrants entering USA during the period 1969-1979 came from Asia alone and accounted for nearly 30 percent of the rise in employment of physicians and related practitioners, 12 percent in that of engineers and 8 percent among scientists, during the period.

These studies also reveal that India is one of the major sources of HQM. The UNESCO Report, 1975 says that among the Indian specialists working abroad, 30 percent are scientists and 54 percent are engineers. The World Health Organisation (WHO) study (1980) termed India as the world's largest donor of medical manpower as 'there was scarcely a recipient country where there were no Indian physicians. India, however, hardly maintains any systematic data regarding emigrating HQM. The CSIR maintains Indians Abroad register but it does not provide reliable data as registration is not compulsory. Generally, only those, who are interested in returning and getting placements through CSIR pool, get registered. On an average, nearly half of the registrants have returned to India. On the basis of immigration data of main receiving countries of the developed world, Nayyar(1994) has shown the highly increasing rate of immigration of Indians for the US and Canada and falling rate for the UK.

More recently, it has been suggested that brain drain from India to the US has actually declined quantitatively and qualitatively(Coombs 1985; Minocha 1987). Philip Coombs(1985) claims to notice a more general trend for the late seventies of a decline in brain drain from the third world countries. In fact, such conclusions are usually based on the analysis of visa categories. For example, a CSIR Report (1983) shows that 16,489 immigrants of Indian origin were admitted to the the US of which 28.5 percent were scientific, technical and professional people, 8.4 percent were students and 63.1 percent were in the category of other immigrants. Nayyar (1994) also reached the same conclusion after analysing the occupation profile of Indian immigrants into USA that the share of HQM has declined during the 1980s. He, however, pointed out that despite this decline the relative share of Indians in providing HQM through immigration into the United States remains very large. The analysis of occupational profile of immigrant people, as reported by immigration data tends to under estimate the magnitude of HQM migration on two counts - (i) unreported occupation of dependents and family preference entrants, and (ii) conversions of non immigrants. As early as 1969, Blaug, Layard and Woodhall (1969) pointed out to those, especially

students, who enter on other visas and later adjust to immigrant status. According to Agarwal and Winkler (1984), these indirect professional immigrants represented 48.5 percent of all professional immigrants, and constituted 10 percent of the number of foreigners in the US institutions of higher education in 1977. Khadria (1990) suggested use of some sort of adjustment based on long run trends in conversions to modify the brain drain related immigration data.

The phenomenon of brain drain has been analysed under different theoretical methodological approaches, eg. International Trade Theory, Welfare Economics, and Human Capital approach. However, the lines of demarcation are not very clear and it is not always possible to separate clearly an explanatory literature into distinct methodological traditions, only the underlying theoretical framework becomes identifiable. The international trade theory concerns itself with international movement of commodities as well as of factors of production, both financial and real. This theory postulates that international migration results from the disparities in economic resources and development between countries and in fact, narrows such gaps because two nations with unequal resource endowments or production can enjoy a bilateral increase in economic welfare by freely exchanging goods, capital and labour. It is thus macroeconomic comparative cost advantages derived by factor endowments that determine, according to this theory, migration between countries. On the basis of this framework, some analysis adopted internationalist approach (H G Johnson, 1967,1968, 1972; Grubel and Scott, 1966). Johnson considers international migration of HQM a beneficial process as it reflects individual choice. He suggested that the sending countries should aim at adjusting the use of educated people to the new prevailing situation of increased relative scarcity, by recognising the higher value of such people in contemporary circumstances, paying them accordingly and seeking at the same time to economize on their use. The welfare economics explanation of brain drain generally discusses the welfare of those remaining behind in the country of emigration and those in the immigrating countries (Grubel and Scott, 1966). The advocates of marginal productivity

explanation of brain drain, which can be seen as complementary to the welfare and trade theory approaches, human capital moves across national boundaries in response to their prices. Therefore, in conditions where human capital is free to seek the highest award, it will tend to flow in directions where it can maximise its returns.

These theoretical explanations, however, suffer from some limitations and weaknesses. The factor endowments theory, on which the international trade theory explanation is based, assumes the factor and factor productivities as given. The theory does not allow any changes in them caused by any external factor, for example, education. In that sense, its application to human migration who have some acquired skills and whose price is generally directly related to their education and training, becomes questionable. A demarcation between labour and other factors and also between different types of labour - unskilled, skilled and highly qualified - is needed in order to explain the phenomenon of human migration - something which the international trade theory has traditionally not done.

The marginal productivity theory explanation of brain drain, as propounded by Grubel and Scott (1966), Berry and Saligo (1960), Tobin (1974), Johnson (1967), reached the conclusion that in a market economy emigration of labour force neither help nor harm the non-emigrants as factors are paid their marginal products in any case. This explanation was severely criticised by many economists like Sen(1973), Bhagwati and Rodriguez(1975), Oteiza (1968), Jolly and Seers (1972), Khadria (1978) on grounds of their applicability and hence conclusions. The validity of this conclusion has been questioned mainly due to fallacy of assumptions of model and unsuitability of the requirements of model to large scale emigration of trained personnel. The marginal productivity theory, for example, requires the factors of production to be homogeneous which does not hold true in case of skilled migration. Similarly, the requirement of perfectly competitive labour market also is not fulfilled even in case of the DCs due to various distortions. The use of a specific production function like Cobb-Douglas with two factors having

unitary elasticities of substitution, and in effect, amounting to infinite elasticities of substitution between human capital and physical capital is too unrealistic to make it applicable to brain drain. The theory also fails to explain certain sociological and psychological aspects related to brain drain.

One more theoretical framework within which brain drain is sometimes explained is Human Capital approach. It maintains that education and training of highly qualified personnel represents a form of investment comparable to physical capital formation. This approach takes the questions of employment, manpower and educational policies. Such an analysis usually attempts to qualify the magnitude of human capital flows either in terms of cost of education and upbringing or in terms of life time earnings and contribution to social product which is foregone by net outflow countries in favour of net-inflow countries. Despite limitations, especially relating to quantification of losses and gains, the approach has definitely been successful in bringing in the social dimension of the phenomenon and hence is superior to the welfarist approaches which mainly emphasized individualistic concerns, as pointed out by Kabra (1976).

As mentioned earlier, it is not always possible to fit any literature on brain drain in any particular framework. But, in many cases explanations seek their theoretical justification in these frameworks, sometimes even without following essentially all the tenets.

The social dimension of brain drain brought the 'nationalist' conception of economic loss. Along with 'internationalist' explanation of brain drain, came a nationalist approach (Pantinkin 1968, Dandekar 1968, Kabra 1976) considering human capital indispensable to a country's economic development. Patinkin observes that the flow of highly qualified manpower results in heavy external diseconomics for the sending countries. He points out that maximising the world welfare is possible only when there is world government. Both Dandekar and Kabra feel that developed countries deliberately open their doors to immigration of skilled personnel. They pointed to the artificial barriers to international labour mobili-

ty which do not allow the labour to move freely in response to the highest price paid. Dandekar, with help of housemaids example, says that the fact that scientists are allowed to immigrate but not the housemaids, shows that it is not so much the invisible hand of income differentials alone which can explain these movements. UNCTAD (1974) study called such immigration laws, a policy of selective population growth where only educated and qualified persons are added to country's human resource stock. Though some 'nationalist' arguments and their criticism of trade theory and welfare approaches are valid to a large extent, they sometimes go too far in making suggestions. For example, Dandekar suggests closing the doors by the LDCs totally to disallow their HQM to migrate and feels totally justified and democratic in doing so. Though it is totally justified to look for way to make the migration of HQM more equal and beneficial for the LDCs, closing the door totally cannot be the solution.

One view favoring free international migration which Adams calls 'cosmopolitan' view, is that science is universal and its benefits cannot be limited to any national barrier (Johnson, 1972). However, this view does not take patent rights and intellectual property rights into consideration. For certain scientific discoveries which have universal applicability this may be true but not for the general migrated lot who work for discoveries that are made commercially patent. If not so, the technology itself may have no relevance for developing countries being at a different level of development as pointed out by Dandekar (1968) and Kabra (1976). In todays scenario of fast increasing role of patents in more and more areas makes this criticism of cosmopolitan view real.

Baldwin (1970) pointed to the migration due to lack of effective demand for that kind of skill and education at home country. He opined that though the LDCs have a pure need for doctors and engineers, economists and educationists, the economy is not always able to absorb all the manpower available and hence surpluses often appear. Minocha (1987) considered the phenomenon of international migration of professional, from India to the US, a case of brain overflow rather than that of brain drain, mainly on

the grounds of widespread unemployment. Though this argument seems valid in certain circumstances as it relieves the sending country of its unemployment problem to that extent, it needs a critical examination. Kabra (1976) suggested the possibility of this surplus being deliberately created by the DCs for their benefit. He feels that sometimes the aid programmes and the various immigration barriers are so designed implicitly as to produce and over produce their needed type of skilled manpower in the LDCs and therby maintain a stock of useful talent for the purpose of maximising their capitalistic profit. Many studies (Kabra 1976, UNCTAD 1974, Amuzegar, 1968) feel that a reverse transfer of technology is taking place towards the DCs in which the LDCs are the losers. Kabra call this a new form of colonialism. On the basis of income gains and income losses, the UNCTAD(1974) study concluded that a massive net income transfer from the developing countries to the United States takes place in the form of brain drain. The estimates of income lost to India in 1970 were highest for engineers, according to this study. Despite limitations of such estimates, they do indicate some sort of transfer taking place in the form of HQM migration resulting to losses to the LDCs and gains to the DCs. As Majumdar (1977) says "this is the welfare rationale behind the unsophisticated but not unjustified popular suspicion that producing a usable engineer at an IIT cheaply and then importing him into the States at the high the US price is a sound economic proposition for somebody in the States".

Some studies point out that emigrating HQM will lead to savings in the sending country as they along with their present or future children will not be using the public utilities and services. Hence the loss of tax revenue may be offset by this savings (Grubel and Scott, 1966). Remittances sent by the emigrated lot is considered as a source of revenue for the sending economy. What this argument neglects is the need for critical HQM in a developing economy as pointed by Baldwin (1970) and Otieza (1968). In cases where emigrating skills are critical for the development and the supply is limited in the home country, as happened with some of the African countries (Baldwin 1970), the emigration certainly involves

a loss, and hence be called brain drain. In fact, it comes out clearly from the survey of literature on the subject that the phenomenon needs country specific study and all types of emigration cannot be labelled as drain. However, in any case, even when there is no shortage of critical skill, it is necessary to know whether the 'gain' from brain migration are sufficient to cover the 'losses' so as not to be called brain drain. But the welfare analysis of gains and losses has been constructed on supposedly little reference to particular characteristics of engineers, doctors and scientists. The model also neglects the role of contracts and public sector employment in field like education where the rules of profit maximisation and consumer demand have limited application, as pointed out by Jolly and Seers (1972).

Some economists have tried to develop models for the calculation of shadow price. Psachoropoulos (1970) has worked out a model of estimating the shadow rates of return to investment in education. Bhagwati (1976) worked out measurements for gains, losses and imputed flows of capital. He apprehends both conceptual and statistical problems in measuring imputed capital flows implied by skilled migration. The 'minimum' set of difficulties is illustrated by considering the simplistic case of once-and-for-all skilled migration from the LDCs to the DCs. To that, he adds the complexities that arise from the possibility of 'reverse' migration of the emigrants. Despite possibilities of calculating the shadow prices, there is always the possibility of the human capital sent out to be underpriced mainly because of the incapability of the internal market mechanism to calculate the social marginal productivity and to account adequately for the social costs that are being incurred on the creation of those skills. The market price may be a wrong index to be used to reimburse the costs of education and training (Khadria, 1978). There are, however, some obvious cases where the prices are sufficient to cover the private as well as social costs like Pakistani emigrants working in Restaurants all over the world (Haq, 1972). Similarly, the migration of nurses and technicians from Kerala to middle east countries is seen as beneficial to the economy of Kerala (Govt of Kerala Report, 1987).

To avoid confusion over use of value loaded term for all types of brain drain, Khadria (1978) suggested a Welfare Economic classification of brain migration into brain export, brain overflow, brain exchange and brain drain. Brain overflow refers to the surplus of manpower created which lies unabsorbed and migrants. Brain export is a case of migration, where manpower is created deliberately, unlike brain overflow where the surplus is a result of some misallocation or mismatch, so as to sell its services at a price which is higher than its social costs. Brain exchange refers to the exchange of scholars, researchers and students between the countries. Brain drain refers to the migration of high quality manpower and involves loss to the emigrating country in form of costs of education, shortage of crucially required manpower, dislocations in the economy in the short run and an adverse impact on welfare. This sort of classification is certainly helpful in isolating brain drain from other types of migration and treat it accordingly.

A good number of studies are available dealing with causes of migration. The factors leading to migration are generally classified as 'push' and 'pull' factors. The essential point implied by this classification is that a combination of forces operate at both the ends to bring such large scale and sustained migratory flows. Oteiza (1968) emphasised the need for considering subjective or motivational factors and formulated a preference differential which included income, logistic support, prestige and other factors differential in order to decide the place to work. Though not questioning the basic implications of pull-push classification or differential analysis, Kabra (1976) classified the forces as subjective and objective to make it more exhaustive. Studies have also tried to determine the micro and macro determinants. Studies analysing micro determinants include those on internal migration as well. Among the micro determinants of migration, income differential has been emphasised most. Through different methods (the rate of return approach, the discounted present value of lifetime earnings, etc.) the

economists have tried to calculate the differential in earnings and reached the conclusion that any positive differential in income of the DCs over that of the LDCs is the strongest pull factor (Grubel and Scott, 1966; Todaro, 1969; Haris and Todaro, 1970; Krugman and Bhagawati, 1976; Creedy, 1974) . Unitar Report (1971), based on empirical evidence from many DCs and the LDCs support this hypothesis. Some studies have, however, questioned the explanation (Sen 1971, 1973; Triantis 1971;). Sen questioned the explanation with the help of an empirical analysis using general national income comparisons between various sending countries to the USA which showed no important correlation between national income differential and migration patterns. Triantis pointed out that it is the relative income differentials which were more important explanatory factor. Agarwal and Winkler (1984) concluded that the relative wage rate is more significantly related to total professional immigration than is relative income, confirming Psachauapoulas' (1973) earlier findings.

Apart from economic factors, many other factors have been identified and analysed at both micro and macro level. Most of the studies, however, emphasise supply side by analysis availability of human capital and decision to migrate. Better opportunities, high income and higher wage rates are the only few factors, usually mentioned from the demand side. Some studies, however, have referred to legal factors in forms of immigration laws and various other rules which regulate the flow of migration in modern days. Sen (1971) explicitly recognised the role of immigration laws and quota systems in explaining the pattern of time series data of immigration. Khadria (1990) through his analysis of immigration laws and migration patterns into the US has shown that a large number of professional immigrants remain unreported under occupational category leading to underestimation of H&M immigration.

During 1970s, many studies were done on the topic of brain drain and taxation. Two volumes, one edited by Bhagwati & Partington (1976) and the other by Bhagwati (1976), include most of the important

writings on the issue. Bhagwati-Partington have distinguished between two principal objects of a brain drain related tax - the immigrant themselves and the Developed Countries (DCs) of immigration. The rationale for taxing emigrants is either compensation for the loss inflicted on the LDC or simply an extension of progressive income taxation. The rationale for taxing the DC is either compensating poor country of its loss or transfer of their gains to poor country. The revenue, obviously, is basically meant to pay LDC for its investment in HQM. The choice of the rate of taxation depends on whether the tax is being imposed on immigrants or the DCs of immigration and various theoretical and econometric analysis were presented on the issue. The practical applicability of such proposals, however, remains questionable due to politico-legal reasons and hence the whole analysis has limited relevance in that sense. Academically, of course, this does provide some insight into the whole issue.

The literature is sparse as far as macro-economic analysis of the phenomenon is concerned, especially in context of HQM migration. Several studies have dealt with macro economic questions related to migration of skilled and semi skilled workers from India and other skilled countries to the middle east region of oil rich Gulf countries (Nayyar, 1987; Saith, 1987, Amjad, 1987; Govt of Kerala Report, 1972). Nayyar's recent work (1994) has also incorporated HQM migration and macro economic implications related to it.

2.2 STUDIES DEALING SPECIFICALLY WITH IIT MIGRATION

In the Indian context, the focus of brain drain discussion has shifted from medical graduates to scientists and engineers in recent years. The institutions like IITs attract special attention due to high resource allocation to them and high rate of migration of their graduates. The per capita expenditure is highest in IITs in the country and it is often said that a large part of that goes waste as most

of the students migrate to the DCs. Though a good number of journalistic articles have been written on brain drain from IIT, very few serious studies are available. Some studies refer to it within general writings related to scientific and technological personnel (Parthasarathi, 1971; Mashelkar, 1989). However, five studies related to migration of IIT graduates deserve detailed mention:

i) IIT Review Committee Report, 1986.

ii) Placement of IIT Graduates (AIU, 1985/commissioned by IIT Review Committee).

iii) Pilot study on magnitude and nature of brain drain of Graduates of the IIT, Bombay (Sukhatme & Madhevan, 1987).

iv) Data Base for brain drain : Institution based study - IIT Madras (Ananth, Ganesh Babu, Natarajan, 1989).

v) A study on the nature of work and place of post graduates Alumni of IIT Bombay (Sukhatme, 1990).

The last three studies were sponsored by the Department of Science and Technology, Govt of India. Besides these, some other minor studies dealing specifically with IIT migration are also relevant (Perkins, 1986; Swami, Malhotra and Mathur, 1986).

All three DST studies are mainly concerned with determining the magnitude of international migration and its causes. The studies done for Bombay IIT also try to get a feedback on curriculum. On the aspect of migration of IIT graduates, the Review Committee Report also confines itself to determine the extent of migration and reasons for it. The AIU study, as the title suggests, mainly deals with placements of IIT graduates both in India and abroad and as such do provide some useful information relevant for brain drain analysis. The methodology is more or less same for all the studies as the data has been collected through questionnaires sent to IIT alumni both in India and abroad. The causes of brain drain have also been identified mainly on the basis of their perception only. The Madras study supple-

mented it with viewpoints of industrialists and of the then final year students.

According to IIT Review Committee Report, on an average 20 percent of IIT graduates leave the country. However, the IIT Bombay study(1987) puts this percentage at 30.8 for B.Tech graduates and IIT Madras study estimated this percentage to be somewhere between 24.7 and 27. IIT Bombay study(1990) for post graduates shows that the rate of migration is lowest for Ph.D. alumni (9.8%) and highest for B.Tech graduates (30.8), the rate of M.Tech alumni falling in between (13.4). Taken together, the study estimates that around 21.4 percent are likely to settle abroad altogether. The lower rate of migration for B.Tech graduates of IIT Madras compared to that of Bombay is perhaps explained by the length of period the study is based upon. The Bombay study is based on migration during a short period of five years between 1973-77 whereas the Madras study considers a longer period of 20 years (1968-87). Since the migration rate is lower for earlier periods (1968-72 = 20%, 1973-77 = 22%) and higher for later periods (1978-82 = 27%, 1983-87 = 35%), the average obviously is a pulled down figure. The Bombay study (1987) shows that out of those abroad, 82.6 percent were in North America, 7.8 percent were in the Middle East and only 9.7 percent are in all other foreign countries.

Discipline-wise breakup of migration rates for engineering graduates for these IITs shows that for certain areas, like Chemical and Mechanical Engineering, this is higher for both IITs but the trend is not the same for other branches. For example, in electrical engineering, as much as 42.8% students migrate from IIT Bombay, whereas only 19.2% do so in case of IIT Madras. Hence, nothing conclusive can be said about opportunities in India or abroad on this basis. However, Computer Science is a relatively new discipline and as these studies show - the rate of migration is very high (more than 50 percent). 82 percent of B.Tech and 56 percent of M.Tech final year students of computer science thought of going abroad (Perkins, 1986).

The DST studies have divided the major factors influencing decision to go abroad into pull and push factors. Better opportunities, academic facilities, financial benefits and a spirit of adventure are outlined as major pull factors. Poor career prospects, poor industrial development in India, adverse conditions of political situation, poor utilisation of knowledge, peer pressure, family and faculty influence and lack of interaction with experts as well as poor Post-Graduate programmes in India are identified as major push factors. These factors are more or less similar to those, which have been identified by many studies in case of other the LDCs. The IIT Review Committee Report(1986), however, concludes that attractive opportunities abroad, rather than lack of academic facilities in India is the main reason of brain drain. Lack of guidance with regard to the country's development needs and the ways in which IITs can contribute to it is considered to be a major reason, according to the IIT Review Committee Report(1986). The Report also considers the lack of interaction between IITs and industry and irrelevance of IIT curriculum to actual industrial practice as other major contributory factors for IIT graduates to decide to go abroad.

The reasons for either not going abroad or returning to India after some years of stay are mainly cultural, social and emotional, according to DST studies. Family ties and responsibilities, national pride, sense of belonging, cultural reasons and mechanical life abroad are the most often cited reasons. Job opportunities in India was also found to be satisfying by those who decided to stay or return.

The AIU study revealed that for a majority of the B.Tech graduates working in Indian industry, it is the lack of opportunities to work in their area of specialisation and inability to experiment and

hand, for those engaged in teaching and R&D, it is the lack of financial benefits which is the main cause of dissatisfaction. The study also indicated that only 13% of IIT graduates are engaged in R&D in India, whereas 22% of those who have migrated abroad are engaged in the R&D sector, indicating the inability of R&D Sector in India to fully utilise IIT graduates. Further, it shows that 25% of IIT graduates seek employment in marketing and management, where their technical knowledge is hardly utilised. The Bombay IIT study (1987) shows that 42.1% of B.Tech graduates are in the 'executive/manager' class. This trend in placement leads to the question of relevance of curricula to their jobs. The AIU study reveals that a substantial proportion (30-60%) of respondents felt that their courses were not relevant to their professions. The IIT Bombay study (1987) also support this view as a number of respondents settled in India felt that there was a lack of emphasis on practical work and inadequate industrial exposure. Post-graduate respondents also felt the need for making programmes more relevant to requirements of India industry. Swami, Malhotra, and Mathur (1986) also consider the specialised courses which have hardly any relevance for Indian economy to be one of the main reasons of brain drain from IIT.

It is significant that a large percentage (50-60%) of respondents in IIT Madras study considered migration as undesirable but unavoidable. They believed that the phenomenon constituted a drain of brain. Whereas a small percentage of them looked at it as constituting a brain bank. A few of the respondents considered this phenomenon as of no consequence to the nation as a whole.

The need for proper guidance, counseling and information regarding opportunities and incentives at home country have been emphasised by all these studies. Expansion and strengthening of industrial base as well as liberalisation of the economy to retain and utilise IIT graduates have also been suggested forcefully. National problems and national aspirations deserve more space in IIT curricula, according to

these studies. The IIT Madras study, however, guards against the emphasis on specialised courses and views that the general socio-political climate of the country needs to be improved rather than changing the curricula of IITs. Majority of respondents do not support restrictive measures. The one restrictive measure which found some support was the institution of compulsory national service for a limited period of time after graduation (Madras Report(1989), Review Committee Report(1986). Many respondents in the Madras report pointed to the impracticability of imposing Bhagwati type taxation. The general view is in favour of positive measures as against restrictive measures.

It is obvious from the above discussion that the focus of all the studies dealing specifically with international migration from IITs is on determining its magnitude, causes and suggestion to mitigate them. None of the studies tried to look at the question whether those emigrants who have settled abroad are maintaining any link with India. This is an issue which is of great significance for the Indian economy. Though it is not quite easy to determine the contributions quantitatively, whether in financial or human capital terms, the question deserves serious investigation. Any study providing some insight into this particular aspect may prove helpful in determining the exact level of 'brain drain' and will certainly have policy implications also. This is precisely what the present study intends to explore.

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CHAPTER III

THE INDIAN INSTITUTES OF TECHNOLOGY : A PERSPECTIVE AND AN ANALYSIS OF THE ROLE OF FOREIGN AID

The Indian Institutes of Technology (IITs) set up during 1950s and early 1960s were not just other engineering colleges being started. They were established according to the set priorities and policies based on the needs of the economy and had certain particular objectives to fulfill. To deal effectively with the phenomenon of migration of HQM in general and IIT graduates in particular, it becomes essential to look at these policies as well as the objective, of setting up IITs. In the light of these policies and objectives, this chapter also analyses the establishment costs and recurring expenditure in IITs as well as the trends in the migration of their graduates to developed countries. Besides, the role of foreign aid in establishment and growth of IITs and in migration have been examined with the help of a theoretical analysis and available evidences.

3.1 ESTABLISHMENT AND OBJECTIVES OF IITS : A BACKGROUND

3.1.1 STATE OF TECHNICAL EDUCATION : PRE INDEPENDENCE PERIOD

With the establishment of a few engineering colleges in the second half of 19th century, a beginning was made in the field of higher technical education. Between 1847 and 1858 four engineering colleges had been established in India chiefly for the training of Civil engineers for the provincial and Central Public Works Departments. Certain other branches of engineering were also started later. During late 19th century and early 20th century, the country witnessed an emergence of industrialisation, mainly due to initiatives of some private entrepreneurs, which in turn led to an expansion in demand for technical personnel. The locally trained technical personal, however, mainly worked at subordinate levels and higher level jobs were confined to those who were trained in Great Britain. The Indian Industrial Commis-

sion of 1916-18[1] observed that

> ...The higher branches of the engineering services in the country absorb but a very small proportion of the engineering students who pass through the colleges and the rest enter the upper subordinate ranks or find private employment of a not very remunerative character. The greater part of the work done in each college is the training of upper subordinates, lower subordinates, surveyors and draughtsman. In the four principal colleges, increasing attention has in recent years been paid to the provision of instruction in mechanical and electrical engineering; but the measures adopted are inadequate and are conceived on altogether too narrow lines to meet the needs present and prospective of a rapidly expanding industrial system. In mechanical engineering which, outside the railway workshops, is mainly carried on by private enterprise, we find that in the absence of a proper system of training, they have seldom attained to positions of importance or responsibility.

The Indian Industrial Commission (1916-18) was the most important of the several Commissions and Committees convened before 1947 which strongly emphasised the need to train people adequately for modernisation. The Commission observed that unlike West, where industrial and scientific research ran parallel to new industrial ventures and enterprises, in India the scientific and technical education which could help industry to grow, was lagging behind. The Commission dealt in deatil how existing facilities should be expanded and improved upon to achieve the aim of "self-sufficing" India. In the following period, new engineering colleges and polytechnics were started and courses of study were diversified. Various new enterprises were also started in many fields, i.e., Iron and Steel, Textile, Chemicals etc. They created demand for more engineers and technicians. Thus, by 1947 when India became independent, an awareness of the importance of technical education was already there. In 1947, there were 38 engineering colleges with an admission capacity of 2940 students each year for first degree course. However, In 1945, as Expert Committee under the Chairmanship of Nilratan Sircar was appointed to formulate plans for the establishment of advanced technological institutes. Four higher technological institutes were suggested,

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1. The Indian Industrial Commission (1916-18) was commissioned by the Government of India to look into the problems of industrial development of India.

one in each region of India, for advanced studies and research in engineering and applied sciences. The Committee felt that the existing institutions failed to fulfil the growing needs of industrialisation.

3.1.2 EARLY POST INDEPENDENCE PERIOD : PLANS AND POLICIES

Despite the presence of a number of engineering colleges and growth of industries to a certain extent in some areas, the needs of an independent India were different and much more demanding. Planning was accepted as a means of development and five year plans were adopted as instruments of setting goals, priorities and strategies to achieve them.

Five Year Plans: Taking the first two five-year plan periods 1951-56 and 1956-61, we know that three main strategies of development were adopted: (i) development of a sound base for initiating the process of long run growth, (ii) a high priority to industrialisation, and (iii) emphasis on capital goods industries. In the first plan, all efforts were directed towards solving the severe problems the country was facing both due to long years of colonial exploitation, and partition. As such, highest priority was given to agriculture to overcome the food crisis and bring a stability. Besides, the development of infrastructure with particular emphasis on energy, means of transport, and communication and irrigation facilities were emphasised so as to lay a foundation to future growth.

In the second plan, as we know, the main emphasis was on industrialisation. It was realised that industrialisation was necessary not only for production of industrial goods but also for the development of other crucial sectors like agriculture and infrastructure. Modern agriculture needed critical inputs like tractors, fertilisers and many more equipment which could be produced by sophisticated machinery. This plan gave a higher priority to capital goods industries. It accepted the view that the dependence on foreign countries for capital equipment may prove to be a big obstacle in the long run. The

experience of many countries had already shown that unless a country develops Iron and Steel, heavy engineering, machine tools and heavy chemical industries, it fails to accelerate the pace of economic development.

The strong emphasis on industrialisation and capital goods industries obviously reflected a policy of technological self-reliance which implied that India must produce her own scientists and engineers for design, development, research, teaching and all other scientific and technical activities.

Scientific Policy Resolution: It was recognised quite early that manpower planning is an essential element of national development and as early as 1947, a Scientific Manpower Committee was appointed to assess the requirements for various classes of scientific and technical personnel and to recommend measures to meet them. The need to build up the skills, knowledge and competence required for economic progress and to provide industry with productive and socially useful employment was also seen in that period only. The Scientific Policy Resolution in 1958, articulated this strategy as part of a national policy in an extremely well manner:

> 1. The key to national prosperity, apart from the spirit of the people, lies, in the modern age, in the effective combination of three factors, technology, raw materilas and capital, in which the first i.e. technology is perhaps the most important, since the creation and adoption of new scientific techniques can in fact make up for a deficiency in national resources and reduce the demand on capital. But technology can only grow out of the study of science and its application.
>
> 2. It is only through the scientific approach and method and the use of scientific knowledge that reasonable material and cultural amenities and services can be provided for every member of the community, and it is out of a recognition of this possibility that the idea of a welfare state has grown. It is characteristic of the present world that the progress towards the practical realisation of a welfare state differs widely from country to country in direct relation to the extent of industrialisation and the effort and resources applied in the pursuit of science.
>
> 3. The wealth and prosperity of a nation depend on the effective utilisation of its human and material resources through industrialisation. The use of human

material for industrialisation demands its education in science and training in technical skills. Industry opens up possibilities of greater fulfilment for the individual. India's enormous resources of manpower can only become an asset in the modern world when trained and educated.

4. The Government of India have accordingly decided that the aims of their scientific policy will be;

(i) to foster, promote and sustain by all appropriate means, the cultivation of science and scientific research in all its aspects - pure, applied and educational;

(ii) to ensure an adequte supply within the country of reserach scientists of the high quality and to recognise their work as an important component of the strength of the nation;

(iii) to encourage and initiate with all possible speed, programmes for the training of scientific and technical personnel on a scale adequate to fulfill the country's needs in science and education, agriculture and industry and defence;

(iv) to ensure that the creative talent of men and women is encouraged and finds full scope in scientific activity;

(v) to encourage individual initiative for acquisition and dissemination of knowledge and for the discovery of new knowledge, in an atmosphere of academic freedom; and

(vi) in general to secure for the people of the country all benefits that can accrue from the acquisition and application of scientific knowledge.

It is in this light of scientific policy and planning strategy, the establishment and objectives of IITs should be seen and examined.

Establishment and objectives of IITs:

The IITs were established mainly on the basis of recommendations of Sarkar Committee to meet the enormous demand for technical personnel of highest order required for sustaining the post independence planned industrial development. The first institute was established at Kharagpur in 1951, the second at Bombay in 1958, the third at Madras in 1959 and the fourth at Kanpur in 1960. The Institute at Delhi, came into existence in 1964 through an amendment effected in 1963 to the Institutes of Technology Act.

This amendment was sought to raise the status of the College of Engineering and Technology, Delhi (started in 1961) and renamed it as Indian Institute of Technology, Delhi. These IITs were declared as Institutes of national importance under Institutes of Technology Act, 1961.

The goals and objecties were derived from the Sarkar Committee Report referred to earlier. In addition, the IIT Act and statutes of the IITs indicate the lines along which IITs should develop. According to these documents, the IITs are expected:

- to be higher technical institutions on the line of Massachusettes Institute of Technology(MIT);
- to provide for instruction and research in some branches for Engineering and Technology, Science and Arts for advancement of learning and dissemination of knowledge in specific branches.

Two broad objectives which emerge from this are:

(i) The advancement of knowledge through education and reserach mainly in both Pure and Applied Sciences and Engineering; and

(ii) Service to the community and nation through the use of their resources, both intellectual and material through:

(a) providing facilities for retraining the teachers belonging to other institutes to improve the quality of engineering and technological education in the country as a whole.

(b) consultancy services and research which could not be achieved in the normal way, to meet the special needs of the industry;

(c) continuing education for professionals working in the industry.

The Science Policy Resolution of the Government of India(1958), referred to earlier in detail, is a basic document of relevance to the IITs. One more recent document, the Technolgy Policy Statement(1983) spells out the requirements from prime institutes of technolgy in modern days. The statement states that technological advances are influencing life-styles as well as societal expectations. The Technology Policy Statement affirms that

- technology must relate to our people's aspirations and to our local needs;
- technology cover both manufacturing and servicing sectors.

The statement affirms that the base for this consists of trained manpower. The IITs, as institutes of national importance, have this special responsibility to resonate these expectations by implementing these objectives, through their education, reserach and other related activities like training and consultancy.

It is obvious from the above account that though IITs are one of the various institutions in the country to provide degress in engineering, science and technolgy, they were established to fulfill certain greater and bigger objectives and not for merely providing degrees. To develop them into centres of excellence of international standard, huge investments were made in order to provide the best of facilities and faculty. The next section deals with the trends in expenditure and costs in IIT education with the help of available evidences.

3.2 TRENDS IN COSTS AND EXPENDITURE IN IITS:

At the time of establishment and growth during initial period, the IITs reaceived handsome foreign aid under various bilateral arrangements from some developed countries as well as international

agencies. These foreign aids bore a substantial share of the total capital costs as well as some share in recurring expenditure, though not so substantial. This would be discussed later in this chapter. As such the discussion in present section is limited to trends in costs and expenditure in general.

One usual criterion generally used in such contexts is per-student expenditure which is very high in IITs, specially compared to the general engineering colleges. Table 3.1 shows the per-student recurring expenditure in IITs for the year 1970-71 at current prices which was 2.85 times higher than that for all existing institutions put together. As the later includes IITs, the amount must be even lower if these are excluded.

TABLE 3.1

PER STUDENT RECURRING EXPENDITURE IN IITs AND OTHER ENGINEERING INSTITUTIONS (1970-71)

	IITs	All Engineering Colleges and Institutes (degree and above)
Per student Expenditure (in Rs.)	7880	2768

Source : IAMR Report No.3/1975 : Pattern of Expenditure and per student cost in the Indian Institute of Technology; Institute of Applied Manpower Research, New Delhi, September 1975 for IIT, and IAMR Working Paper No.13/87; A study on cost and per student expenditure on technical education by levels in India (1971-72 to 1977-79); Institute of Applied Manpower Research; New Delhi, April 1987.

PER STUDENT RECURRING EXPENDITURE IN SELECTED ENGINEERING INSTITUTIONS (1986-1986)

INSTITUTION	RECURRING EXPENDITURE (Rs. lacs)	WEIGHTED STUDENT POPULATION	PER STUDENT EXPENDITURE (Rs.)
Roorkee	979.04	3916	25001
IIT Kanpur	1161.21	2770	41921
IIT Delhi	1322.68	3384	39086
IIT Madras	1026.53	3369	30470
Jadavpur University	468.74 *	2395	19572
MNREC Allhabad	179.33	1326	13524
PEC Chandigarh	248.00	1340	18507
VREC Nagpur	211.72	1596	13266
JNTU	406.55	2608	15589
Anna University	734.68	4234	17352
REC, Kurushetra	180.89	1503	12035
IISc, Bangalore	1149.21	2664	43139
REC Roorkela	162.84	1453	11207
MREC Jaipur	162.80	1201	13555
REC Durgapur	210.00	1439	14593
REC Warangal	226.12	1392	16244
REC Srinagar	157.05	1387	11323
NIT Gwalior	90.00	991	9082
ZHCET AMU	470.28 *	2220	21184
MSU Baroda	283.03 *	3031	9338
SJCE Mysore	204.30	1842	11091
BEC Patna	190.00	1565	12141
GEC Raipur	81.30	1124	7233
GCT Guwahati	104.45	930	11231
MIT Muzaffurpur	92.00	810	11358
GEC Tirunelveli	60.00	900	6667
GEC Ujjain	85.00	725	11724
DPIT Nadiad	45.00	1080	4167
LEC Morbi	1234.74	1333	92629
JEC Johrat	80.10	835	9593
JNNCE Shimoga	24.10	656	3674
MJCET Hyderabad	68.00	772	8808
GCT Coimbatore	110.00	1210	9091

* Estimate for the faculty of engineering and technology of the respective universities.

Source : Employment pattern of Scientific and Technical Personnel : A study on the competence of S & T Educational Institutions" - Centre for Science, Technology and Environmental Policy Studies, New Delhi, 1990.

At present, besides IITs, the degree level programmes in engineering are conducted at the Indian Institute of Science (IISc), 17 Regional Engineering Colleges (RECs), a few 'deemed university' institutions and university departments and about 350 State level engineering colleges.[2] The IITs, Indian Institute of Science (IISc) and technical universities offer post-graduate and reserch degree programmes also, with an emphasis on technology development. Some of the other institutions also offer post-graduate programmes. Table 3.2 shows per studet expenditure of selected institutions in the year 1985-86. It is obvious that there is a large gap in per student expenditure of various institutions. Whereas per student expenditure for IITs varied roughly between Rs.30,000 annually to Rs.43,000 annually, for the rest of the instituions, barring some, it varied between Rs.3500 per annum to Rs.12,000 per annum The Indian Institute of Science (IISc) was the only institution to exceed per-student expenditure of IIT and Roorkee University with a per capita expenditure of Rs.25001 Per annum reached somewhere near IITs. The comparison of Table 3.2 with Table 3.1 also shows that the recurring expenditure within IITs have increased manifold during the period 1970-71 and 1985-86. In 1985-86, the average per student expenditure for IITs turns out to be Rs.37,129 per annum whereas this figure was Rs.7,780 in the year 1970-71.

Another point to be made here is that both set of data in Table 3.1 and Table 3.2 consider only recurring expenditure. Non-recurring expenditure which mainly consists of capital investments on building, equipment etc. are also much higher for IITs and if that is taken into account, the difference between IITs and other general engineering colleges would become even wider.

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2. Swaminadhan Committee Report (1994): A High Power Committee on mobilisation of additinal resources for technical education, Ministry of Human Resource Development, Government of India.

3. This was calculated for 3 IITs for which data were available. The data for IIT, Bombay and IIT, Madras were not available.

TABLE 3.3

LIBRARY AND LABORATORY FACILITIES IN SELECTED ENGINEERING INSTITUTIONS
(1985-86)

INSTITUTION	ANNUAL LIBRARY EXPENDITURE FOR BOOKS & JOURNALS (Rs. Lakhs)	PER STUDENT LIBRARY EXPENDITURE (Rs.)	ANNUAL LABORATORY EXPENDITURE (Rs. Lakhs)	PER STUDENT LABORATORY EXPENDITURE (Rs.)
Roorkee	20.00	684	-	
IIT Kanpur	95.00	4852	6.50	1970
IIT Delhi	68.00	3181	4.50	2647
IIT Madras	66.00	2906	3.50	1842
Jadavpur University	19.75	318	1.50	500
MNREC Allhabad	6.40	501	3.00	909
PEC Chandigarh	3.00	230	0.80	400
VREC Nagpur	7.70	527	-	-
JNTU	1.66	219	0.75	556
Anna University	33.40	913	1.50	625
MACT Bhopal	3.50	261	-	-
REC, Kurushetra	4.30	288	1.50	588
IISc, Bangalore	97.50	8098	5.50	2157
REC Roorkela	4.00	292	0.35	233
MREC Jaipur	4.80	415	1.50	882
REC Durgapur	5.00	365	1.00	667
REC Warangal	9.50	758	3.00	1034
REC Srinagar	2.00	147	2.00	714
NIT Gwalior	0.50	53	-	-
ZHCET AMU	-	-	0.75	357
MSU Hyderabad	6.90	233	1.00	435
SJCE Mysore	3.00	163	2.00	833
BEC Patna	1.05	147	2.00	1000
GEC Raipur	1.15	105	0.40	333
SVUEC Tirupati	-	-	0.95	655
GCT Coimbatore	4.50	381	1.00	444
GCT Guwahati	1.00	108	1.00	1111
MIT Muzaffurpur	1.00	127	1.00	476
GEC Tirunelveli	1.50	166	0.30	200
MS Ramaiah Bangalore	5.00	199	0.30	167
GEC Ujjain	1.50	245	0.60	500
DPIT Nadiad	1.20	111	1.50	750
LEC Morbi	3.00	156	-	-
JEC Johrat	1.00	67	0.75	357
JNNCE Shimoga	0.50	61	-	-
MJCET Hyderabad	0.50	76	0.30	167
	0.50	78	0.30	222

Source : Employment pattern of Scientific and Technical Personnel : A study on the competence of S & T Educational Institutions" - Centre for Science, Technology and Environmental Policy Studies, New Delhi (1990).

Adequate laboratory and library facilities are two important requirements for maintaining quality of education and training in any instruction providing technical education. The trends as evident by data in table 3.3 concerning per-student library and per-student laboratory expenditure for various colleges[4] are not very different from those suggested by table 3.2. Per student library expenditure for IIT on an average turns out to be Rs.3646 per annum whereas for others it falls somewhere between Rs.50 to Rs.500, except some. Three institutions, Roorkee University, Anna University and REC, Warangal spend somewhere between Rs.50 and Rs.500 per annum per-student library expenditure, and this ratio is very high, higher than IITs also, for IISc at Rs.8098. Similar is the case for per-student laboratory expenditure, except that in this case, the ratio for IITs, (Rs.2153 per annum) is equal to that of IISc at Rs.2157 per annum. These data do not include laboratory expenditure on capital account which also must be much higher in IITs compared to various other engineering colleges.

Another indicator which reflects the academic quality and also indirectly the level of expenditure, is ratio of students to every teacher. Table 3.4 shows student teacher ratio for two years - 1974 and 1984, for all the IITs. This ratio is not only low for these, but they have also shown a decline during the ten year period except in IIT Bombay. Table 3.5 reveals a further decline for three IITs in the following year. This table also depicts the number of students per laboratory staff along with teacher-student ratio for various engineering colleges. In this case, though only IISc has a lower ratio of studetn-teacher at 2.7 and two universities - Roorkee and Jadavpur are in line with IITs with their ratios at 6.5 and 6.7 respectively, many others have also quite low student teacher ratio. Twelve more institutions had a ratio below 10 and sixteen more had a ratio between 10 and 15. Only three institutions had a ratio of more than 15. However, the difference widens in case of ratio of laboratory staff and students. Here ten institutions have a ratio of more than 15 students per laboratory staff whereas the IITs have a lower average ratio of around 4.13. In this case also Roorkee comes equilavent to IITs and IISc has a lower ratio than IITs.

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4. The ratio as well as per-student laboratory expenditure for IITs is calculated for three IITs as the data for IIT, Kharagpur and Madras are not available from the same source.

Despite the fact that, in case of student-teacher ratio, the difference between IITs amd other general institutions is not as wide as in case of her student library and laboratory expenditures the IITs certainly have a significantly lower student-teacher ratio as well as laboratory student-staff ratio. Since the salry-structure for faculty members in IITs is higher as compared to other colleges[5] a high student-teacher ratio means higher expenditure on salaries and other facilities being provided to teachers.

Table 3.4

STUDENT-TEACHER RATIO IN IITs (1974, 1984)

1974			1984		
Number of Teachers	Number of * Students	Number of Students per Teacher	Number of Teachers	Number of * Students	Number of Students per Teacher
389	2260	5.81	454	2027	4.46
283	2222	7.85	339	2808	8.28
295	2254	7.64	346	2453	7.09
264	1910	7.23	284	1930	6.8
235	1901	8.09	372	2708	7.28
1466	10547	7.19	1795	11926	6.64

* This includes both under-graduate and post-graduate students

Source : IIT Review Committee Report, 1986.

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5. For information on salary structure of faculty members in IITs, see IIT Review Committee Report, 1986.

TABLE 3.5

STRENGTH OF TEACHERS AND LABORATORY STAFF IN SELECTED ENGINEERING INSTITUTIONS
(1985-86)

INSTITUTION	Number of Teachers	Number of Students per Teacher	Number of Laboratory & other Technical Staff	Number of Students per Laboratory Staff
Roorkee	450	6.5	700	4.2
IIT Kanpur	308	6.3	500	3.9
IIT Delhi	390	5.5	507	4.2
IIT Madras	352	6.5	525	4.3
Jadavpur University	327	6.7	341	6.4
MNREC Allhabad	104	12.3	133	9.6
PEC Chandigarh	129	10.1	199	6.5
VREC Nagpur	141	10.4	125	11.7
JNTU	287	9.4	280	9.6
Anna University	423	8.6	590	6.2
MACT Bhopal	150	8.9	105	12.1
REC, Kurushetra	154	9.7	70	6.6
IISc, Bangalore	450	2.7	552	2.2
REC Roorkela	146	9.4	130	10.6
MREC Jaipur	108	10.7	98	11.8
REC Durgapur	120	11.4	125	10.9
REC Warangal	165	7.6	151	9.5
REC Srinagar	125	10.9	146	9.3
MITS Gwalior	75	12.6	70	13.5
ZHCET AMU	155	8.6	200	6.7
MSU Baroda	252	10.0	200	14.8
SJCE Mysore	133	13.3	81	21.9
BEC Patna	60	11.9	51	14.0
GEC Raipur	93	11.8	105	10.4
SVUEC Tirupati	110	8.1	90	9.1
GCT Coimbatore	129	9.1	150	13.1
GCT Guwahati	110	8.4	80	11.5
MIT Muzaffurpur	85	9.3	-	-
GEC Tirunelveli	60	15.0	50	18.0
MS Ramaiah Bangalore	195	12.9	120	20.9
GEC Ujjain	43	14.2	36	17.0
DPIT Nadiad	48	22.5	37	29.1
B.Vidyapeeth Pune	100	19.2	125	15.4
LEC Morbi	116	12.9	68	22.0
JEC Johrat	91	9.0	63	13.0
JNNCE Shimoga	60	10.9	35	18.7
MJCET Hyderabad	48	16.1	47	16.4

Source : Employment pattern of Scientific and Technical Personnel : A study on the competence of S & T Educational Institutions" - Centre for Science, Technology and Environmental Policy Studies, New Delhi, 1990.

Note : "-" denotes not available.

Table 3.6 and 3.7 provide certain additional information regarding all the IITs - (i) The trends in 'institutional' and total per student expenditure and differences between them; (ii) the difference between per student expenditure for an under graduate course and that for a post-graduate course; and (iii)the difference between 'gross' and 'net' per student expenditure. Though these data are not current and relate to the period 1968-69 to 1971-72, it can very well be said that they do indicate about the current prevailing trends in IITs in general. Additionally, they are very much relevant from the point of view of survey of IIT migrants who are either living in Western countries for quite some time or have come back after staying abroad for a substantial period. Many of these migrants had studied in the IITs during this period.

The 'Institutional Expenditure' in Table 3.6 and 3.7 has been defined as the expenditure incurred by an Institute in the process of imparting education and training to graduate, post-graduate and research students. It includes expenditure on pay, allowances and working expenses of teaching departments, laboratories and workshops, scholarships, expenditure on library, hostel etc. and, also a part of expenditure on establishment, estate and security. Mainly, the municipal functions, not considered part of institutional expenditure have been kept out. Both the Institutional and total expenditure have been differentiated for undergraduate and post-graduate students. This has been done by compiling composite indices[6] with the help of following procedure (i) salaries and allowances of teaching staff were apportioned giving due weight to the actual demand for the time of various levels of teaching staff in under graduate and post-graduate courses; (ii) identification of items of exclusive use and relevance either for undergraduate or post-graduate course; (iii) actual allocation of scholorship funds for the two levels of course; and (iv) apportioning of expenditure on all other items according to the ratio of student enrolement in these two level of courses. Gross expenditure, as referred to in table 3.6, refers to total expenditure borne out by total income of the institute through grants, fees and other incomes. Net ex-

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6. See IAMR Report No.3/1975 titled "Pattern of expenditure and per student cost in the Indian Institutes of Technology; Institute of Applied Manpower Research, New Delhi for detailed method of computation of Institutional Expenditure and procedure of compiling composite indices.

penditure as referred to in table 3.7 relates to expenditure borne out by total incomes minus fees and other income collected by the students. In other words, it is estimated by subtracting the component of income collected by students from the gross expenditure.

Both the institutional and total per student expenditure have gone up between the period 1968-69 and 1971-72 for all the IITs(Table 3.6). The institutional expenditure for postgraduate students is higher than that for undergraduate by 1.75 times to about three times in different IITs. On an average, per-student expenditure for postgraduate students was twice to that of undergraduate course in both the years. The difference between institutional and total expenditure is not the same for these two levels - for undergraduate level, institutional expenditure covered 77% of total expenditure for both the years whereas it was 87% in 1968-69 and 85% in 1971-72 for post-graduate level. These percentages are for IITs as a whole.

The estimate of per student net expenditure shows that the share of income through fees and other means received from students was around 6% for post-graduate students in case of institutional expenditure both in 1968-69 and 1971-72. It was slightly higher, in case of total expenditure at 6.6 and 10 percent respectively for 1968-69 and 1971-72. For undergraduate courses, the trends were not much different as the share of fees and other charges was around 11% for total per student expenditure in both the years. However, in case of institutional expenditure, the share went down from 7% in 1968-69 to 2.3% in 1971-72 for undergraduate courses.

Table 3.6 : DISTRIBUTION OF GROSS PER STUDENT INSTITUTIONAL AND TOTAL EXPENDITURE IN IITs
(1968-69, 1971-72) **(IN Rs.)**

Name of IIT	Gross Institutional Expendi ure						Gross Total Expenditure					
	1968-69			1971-72			1968-69			1971-72		
	UNDER GRADUATE	POST GRADUATE	Average	UNDER GRADUATE	POST GRADUATE	Average	UNDER GRADUATE	POST GRADUATE	Average	UNDER GRADUATE	POST GRADUATE	Average
Kharagpur	3776	11560	5156	4343	10002	5618	4963	12747	6344	5808	11467	7083
Bombay	4207	7684	5023	5482	10017	6623	5273	8750	6089	6833	11368	7974
Madras	4296	7582	5095	5591	8088	6485	5788	8754	6287	6787	9284	7677
Kanpur	4897	8397	5908	5516	9564	6769	6556	10056	7567	7697	11745	8950
Delhi	4301	12829	5471	5350	7974	6087	5576	14104	6744	7097	9721	7834
Average	4295	9610	5331	5256	9129	6316	5631	10882	6606	6844	10717	7904

Source : IAMR Report No.3/1975, "Pattern of Expenditure and per Student Cost in the Institute of Technology"; Institute of Applied Manpower Research, New Delhi.

Table 3.7 : DISTRIBUTION OF NET PER STUDENT INSTITUTIONAL AND TOTAL EXPENDITURE

(in Rs.)

Name of IIT	Net Institutional Expenditure						Net Total Expenditure					
	1968-69			1971-72			1968-69			1971-72		
	UNDER GRADUATE	POST GRADUATE	Average	UNDER GRADUATE	POST GRADUATE	Average	UNDER GRADUATE	POST GRADUATE	Average	UNDER GRADUATE	POST GRADUATE	Average
Kharagpur	3431	11033	4799	4801	9508	5303	4251	11853	5599	5092	10519	6314
Bombay	3863	7193	4644	5150	9273	6188	4661	7991	5442	6098	10221	7136
Madras	3947	7082	4710	5275	7575	6110	5143	7951	5579	5918	8218	6743
Kanpur	4720	7994	5666	5315	8986	6452	5747	9021	6693	6728	10399	7865
Delhi	4000	12015	5098	5128	7369	5758	5082	13997	6180	6594	8835	7224
Average	3992	9063	4983	5134	8542	5962	4977	10163	5899	6086	9638	7056

Source : IAMR Report No.3/1975, "Pattern of Expenditure and per Student Cost in the Institute of Technology"; Institute of Applied Manpower Research, New Delhi.

Table 3.8 : TOTAL RECURRING EXPENDITURE AND INCOME (OTHER THAN GRANTS) FOR IITs (1968-69, 1984-85)

(Rs. in lakhs)

IIT	1968 - 1969						1984 - 1985					
	Income from Students (UG+PG)	Income from Other Sources	Total Income	Total Recurring Expendr.	Total Income as % of Rcr'ing Expendr	Income through students as % of total Expendr	Income from Students (UG+PG)	Income from Other Sources	Total Income	Total Recurring Expendr.	Total Income as % of total Expendr	Income through students as % of total Expendr
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Kharagpur	11.09	7.48	18.57	140.61	13.2	7.9	8.49	52.15	60.64	827.86	7.2	1.00
Bombay	8.65	5.56	14.21	132.36	10.7	6.5	9.27	108.57	117.84	1004.38	11.6	0.91
Madras	8.77	3.08	11.85	112.21	10.6	7.8	18.02	123.91	141.93	790.74	17.9	2.10
Kanpur	8.93	4.55	13.48	142.72	9.4	6.3	9.23	85.25	94.48	837.12	11.3	1.00
Delhi	5.69	2.35	8.04	94.7	8.5	6	10.15	72.73	82.88	900.25	9.1	1.00
Total	43.13	23.02	66.15	622.6	10.5	6.9	55.16	442.61	497.77	4360.35	11.4	1.2

Source : (i) IAMR Report No.1/1972, "An Analysis of Pattern of Recurring Expenditure and per Student cost in the Institutes of Technology, 1969-69, Institute of Applied Manpower Research, New Delhi for data for 1968-69, and
(ii) IIT Review Committee Report, 1986 for data for 1984-85.

Notes : (i) Data in column (5), (6), (11) and (12) have been calculated on the basis of given data.
(ii) Total non-plan expenditure for 1984-85, as given in IIT Review Committee Report has been taken as total recurring expenditure for all the IITs.
(iii) Total Income from students include academic fees plus other charges paid by them like electricity charge, room rent etc.
(iv) Income from other sources include miscelleneous income arising from rents, electricity and water charges from staff, application fee for posts, fines, sale of tenders, testing and computer charges, sale of unservicable items etc.
(v) UG - Under Graduate; PG - Post Graduate

TABLE 3.9 : FEE STRUCTURE AT INDIAN INSTITUTES OF TECHNOLOGY (1970-93)

(in Rs.)

TYPE OF FEE PER SESSION (one semester)	1970-71			1990-91			1991-92			1993-94		
	B.Tech. & M.Sc.	M.Tech.	Ph.D.	B.Tech. & M.Sc.	M.Tech.	Ph.D.	B.Tech. & M.Sc.	M.Tech.	Ph.D.	B.Tech. & M.Sc.	M.Tech.	Ph.D.
TUITION FEE	200	300	300	200	300	300	500	750	750	500	750	1000
ADMISSION FEE	10	10	10	10	10	10	50	75	75	50	75	75
EXAMINATION FEE (per course)	100*	100	200	100*	100	200	100*	200	400	100*	200	400
HOSTEL ROOM RENT	100	180	180	100	180	180	250	250	250	300	300	300
FAN/ELECTRICITY/ WATER CHARGES	-	-	-	-	-	-	100	150	150	100	150	150

* This is only for M.Sc. No examination fee is charged for B.Tech.

Note : Till now, the IITs have maintained a parity in the fee structure and hence though table was based on the infromation regarding IIT, Delhi, the information holds true for all IITs.

Source : IIT, Delhi Prospectus for different years.

Table 3.8 gives crucial information regarding the share of income generated through different means by IITs in their total recurring expenditure for two period - 1968-69 and 1984-85. The most interesting factor revealed by this table is that whereas the percentage contribution of total income generated, other than grants, to total recurring expenditure, has increased, though marginally, from 10.6 to 11.3, the share of income generated through students has gone down significantly from 6.8% to 1.3%. This means that though the share of other income through various sources in total income generated has increased, that of fees and other charges from students has decreased. The reason for this is obviously the static nature of fee structure over the years, which does not seem to have kept pace even with the rate of inflation. Table 3.9 shows that the fee structure in IITs remained unchanged till 1991-92, when tuition fee and other charges were increased. Various committees on fee structure of technical institutions and on mobilisation of addtional resources[7] have suggested a steep rise in fee structure so that they cover at least 20% of total annual recurring expenditure.

The above discussion make two inportant facts clear - (i) the per student expenditure in IITs is much higher compared to other general colleges either taken as a whole or in parts,; and (ii) the share of students in bearing this expenditure through academic fees and other charges is quite low and has been falling over the years. This obviously means that the component of social costs is very high in IIT education. This fact, however, does not seem to be realised by all those concerned:

> ..there is not enough awareness in the IITs of the fact that almost the entire cost of education and training of students is in reality paid for by the tax payers and the Government/ the tax payer/the IIT system ought to be looking for all possible avenues of effecting cost reduction and economies of operation to improve the cost-benefit ratio of the tax-payer's investment in the future of the country(IIT Review Committee Report, 1986, pp.73-74)

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7. See C.S.Jha Committee Report on Fees Structure of Technical Colleges(1991) and D.Swaminadhan Committee Report(1994) on Mobilisation of Additional Resources for Technical Education.

TABLE 3.10

TOP 20 SUPPLIERS OF FRESH ENGINEERS TO THE CORPORATE SECTOR*
(INSTITUTION-WISE)

INSTITUTION	NO OF CANDIDATES RECRUITED PER YEAR
IIT Kharagpur	130
IIT Bombay	127
IIT Kanpur	110
IIT Delhi	94
IIT Madras	92
BITS Pilani	91
Jadavpur University	91
Bombay University	74
DCE Delhi	71
Roorkee	71
IT BHU	67
Bharathiar	47
Poona University	47
VREL Nagpur	46
PEC Chandigarh	44
MNREC Allahabad	44
Anna University	42
BITS Ranchi	39
IISc Bangalore	34
TIET Patiala	34

* Includes public, private and Government sectors.

Source : Pattern of Scientific and Technical Personnel : A study of the Competence of S & T educational Institutions; Centre for Science, Technology and Environmental Policy Studies, New Delhi (1990).

TABLE 3.11

TOP 20 EDUCATIONAL INSTITUTIONS IN RESPECT OF ENGINEERING PERSONNEL AND COVETED EMPLOYMENT SECTOR.*

RANKING (on the basis of Relative Employment Productivity Index)#	INSTITUTION
1	Roorkee
2	IIT Kharagpur
3	IIT Kanpur
4	IIT Bombay
5	IIT Delhi
6	DCE Delhi
7	BITS Pilani
8	IIT Madras
9	Jadavpur University
10	IT-BHU
11	MNREC Allahabad
12	PEC Chandigarh
13	Bombay University
14	Calcutta University
15	VREC Nagpur
16	IISc Bangalore
17	JNTU
18	Bharathiar University
19	Poona University
20	Anna University

Source : Pattern of Scientific and Technical Personnel : A study of the Competence of S & T educational Institutions; Centre for Science, Technology and Environmental Policy Studies, New Delhi (1990).

* This table is based on a study conducted by Centre for Science, Technology & Environment Policy Studies, New Delhi (1990). This was sponsored by Deptt of Science and Technology. The study is based on data from 79 institution of Science and Technology and 'coveted' employment sector including 4 S&T Agencies, Central Engineering Services, 9 PSUs, 11 Private Companies and 4 Consultancy firms.

Relative Employment Productivity Index (REPI) for all the institutions for all sectors concerned are calculated as follows by the study :

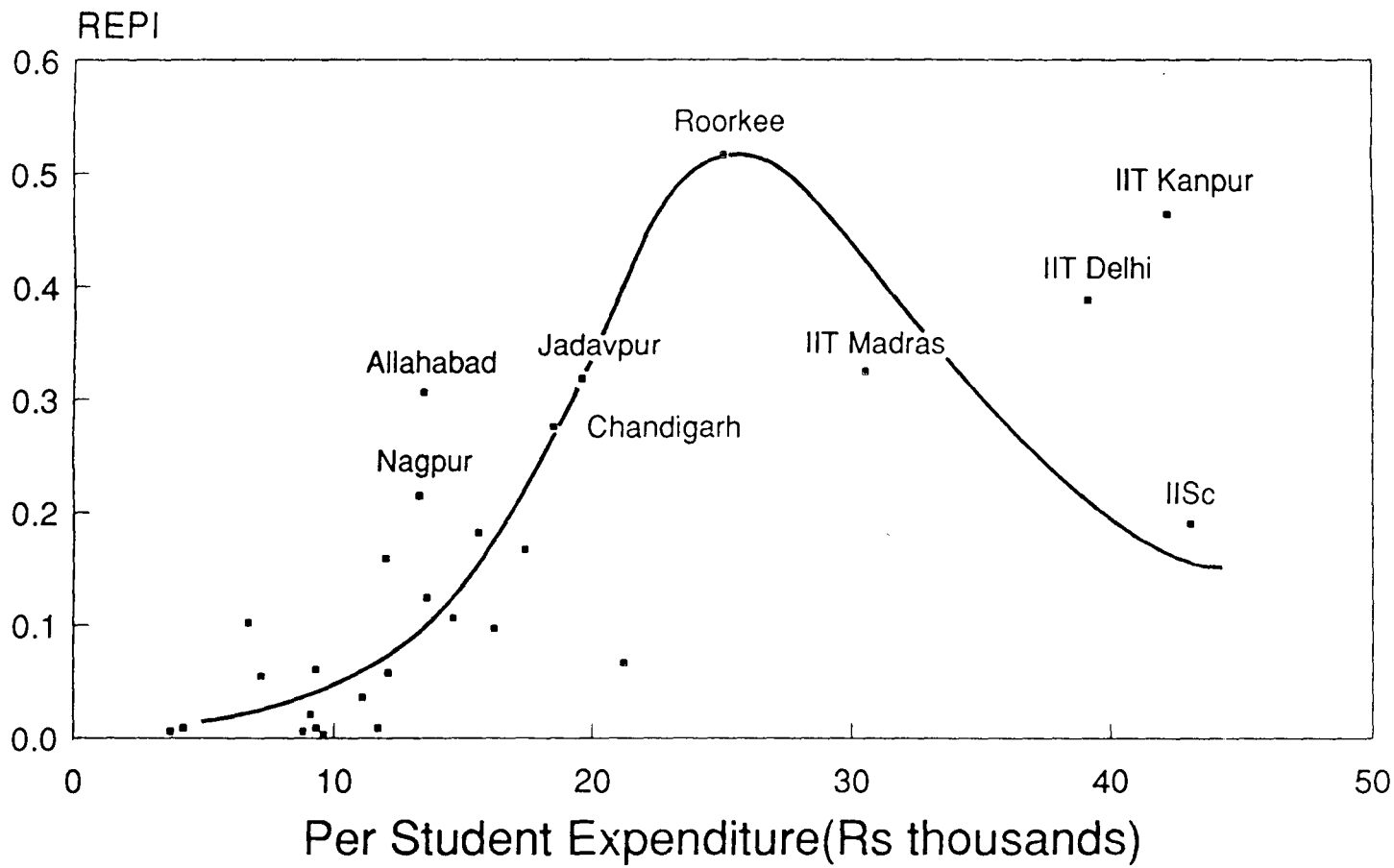
$$REPI = \frac{Enij}{\sum_{ij} Enij} = nj/n \qquad \text{where} \qquad i = 1,2,3,4$$

where nj = Total number of candidates recruited from jth institution in all four sectors; and

N = Total sum of candidates recruited from all institutions in all sectors.

Figure 3.1

Employment Productivity vs Per-Student Expenditure (Engineering Institutions)



SOURCE: TABLE 3.2 and 3.11

In the light of high social costs and per student expenditure, the question of productivity also arises. One study has worked on this line by taking employment pattern and rate as an indicators of productivity. In this context, it is seen that the IITs are the top suppliers of fresh engineers to the corporate sector which includes Reseach & Development (R&D), public, private and consultancy sectors (Table 3.10). Table 3.11 shows the ranking of instituions on the basis of Relative Employment Productivity Index (REPI). Roorkee tops the list followed by IIT Kharagpur, IIT Kanpur, IIT Bombay and IIT Delhi. IIT, Madras is at the tenth position. When REPI of certain selected institutions are plotted along with per student expenditure for these instituions (as given in Table 3.2) and an inverted U shape curve is obtained[8] Certain interesting points come up. The curve is highly dispersed with the IITs and IISc outweighing the per capita expenditure(PSE) figures of other institutions. The diagrm 3.1 shows that only Roorkee University is operating at almost an optimum situation in terms of REPI and PSE as the marginal contribution of PSE is maximum . On the other hand, IITs and IISc are situated at a level of negative marginal contribution of PSE and the other four organisations are operating at positive marginal contribution of PSE situation. The above analysis has certain shortcomings which need to be pointed out here. First of all, the relevant X axis indicator should have been the per student institutional expenditure rather than per student total expenditure which includes expenditure on various heads with no relevance for academic or non-academic life of a student. As seen earlier, for IITs, this part seems to be quite large, especially for under graduates. Even if it is assumed that this is the trend in almost all the large institutions, and hence the comparability is not affected significantly, the second problem which is more important, remains there. This relates to definition of prodictivity. The institutions like IITs, where research and qaulity are emphasised more, only employment rate of fresh graduates cannot be real indicator of productivity. Weightage has to be given to various factors like quality of research, percentage of students going for higher education, etc. in order to arrive at a reliable scale of productivity. The account of internal brain-drain i.e., engineers joining civil services and managerial jobs etc., can also be introduced as negative trait. Here, it seems relevant to mention some of suggestions made by

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8. For detailed analysis, see "Employment pattern of scientific and technical personnel : a study on the competence of s & t educational institutions" op cit, pp.94-97.

Punnayya Committee Report (1994) which were made in context of central universities, but are quite applicable to IITs also.[9] The report suggested the establishment of a system of Academic Audit which would be based on a set of performance indicators, to be developed by the concerned departments and centres. The Committee realised that there cannot be the same set of indicators to determine efficiency for various departments and institutions and hence they need to be developed depending on the nature and aims of any particular stream of study or centre.

Another relevant factor in this context is that a large percentage of IIT graduates go abroad for higher education. A good percentage of those also choose to join labour force in developed countries. At one level, the acceptabce of IITians in premier institutions of world can be seen as their success - and an indicator of their high productivity. Same can be said for the marketibility of these in labour market in developed countries where they compete with the products of best of institutions. However, at another level, this also brings in the question of utility and desirability of such education and training which leads to high rates of permanent migration. The trends conerning migration are being discussed in the following section.

3.3 MIGRATION OF IIT STUDENTS :

No discussion on IIT is complete without a reference to the phenomenon of migration of IIT graduates abroad, especially in the context of high social costs. Unfortuantely, no systematic data is available for the actual rate of migration for every IIT. Permanent migration here means those who join labour force in foreign countries and excludes those who came back after studies. The available evidences are for two specific IITs and for specific period. Table 3.12 and 3.13 show the rates of migration for IIT Madras and IIT Bombay respectively. For IIT Madras the rate of migration has increased from 20% per

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9. See Punnayya Committee Report (1994) on UGC Funding of Institutions of Higher Education; University of Grants Commission, New Delhi, for detailed account of the system of suggest Academic Audit.

annum on an average for the period 1968-72 to 35% per annum in 1983-87. For IIT Bombay, the rate of migration is 30.8% per annum on an average for the period 1973-77. Both the estimates are for B.Tech graduates only. Since B.Tech graduates form approximately 90% of total migrants [10], the trends can be taken as indicative of total migrants. The IIT Review Committee Report(1986), however, estimated the overall migration from the IITs to be roughly 20% annually on an average, for all the students. But this report does not cite evidences and on the basis of IIT Madras and IIT Bombay studies, which are more methodical in their approach, the rate of migration abroad for IIT students seem to be somewhere around 30% per annum. In reality, this rate varies every year and for each IIT. What is sure is that the rate certainly remains high enough to deserve serious attention, especialy in the broad perspective of objectives of setting up IITs and the high costs and expenditure involved.

Table 3.12
PERCENTAGE MIGRATION FROM IIT MADRAS

Years	% migration
1968-72	20.0
1973-77	22.0
1978-82	27,0
1983-87	35.0

Source : IIT, Madras Report "Data Base for Brain Drain: Institution wise study" 1989.

Note : Based on the sample which roughly covered 75% of total students for the period.

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10. See IIT, Madras Report - "Data Base for Brain Drain : Institution based study, 1989".

Table 3.13
PERCENTAGE MIGRATION FROM IIT, BOMBAY

Years	% migration
1973	26.9
1974	34.9
1975	34.7
1976	26.8
1977	30.6
Average	30.8

Source : IIT Bombay Report - "Pilot Study on Magnitude and Nature of the Brain Drain of Graduates of the Indian Institute of Bombey" 1987.

Note : Based on the sample of 67.7 to 82.1% of total students for that year, the average being 73.2%.

As stated above, IITs were set up with the objective of fulfilling the gap of highly qualified engineers and scientists who could provide a leadership in the field of industrial design and production to help achieve the goal of technological self-reliance. Incorporated as institutes of national importance, they are one of the earliest instituions in the country with most modern laboratories and equipment as well as best of experts in different fields. The IITs also had departments of pure sciences, physics, chemistry and mathematics and of social sciences - Sociology, Economics, Literature, Phychology and Management, so that technological education can develop with greater perspectives by interacting with these. This, however, does not seem to have happened to the desired extent - a point which will be discussed in the next section in detail. All those who graduate from IITs are naturally expected to contribute towards national economy in concrete sense. The migration of a substantial proportion of these graduates to developed countries is seen as leakage in the gains which could have arisen from the service of those and the whole amount of social costs incurred during the process of their education and training are considered to have siphoned off. Whether this leakage is a total loss or not - this question has been dealt

with the help of macro and micro level analysis in following chapters. Here some attributes of the respondents of the survey done on IIT migrants are given in the following section :

3.4 ATTRIBUTES OF IIT MIGRANTS :

As stated earier, a survey of IIT migrants who are either settled permanently in some foreign country or are living there for five years and more was conducted. Altogether, 110 complete responses were received. Of these, 13 (11.7%) were

Table 3.14

NUMBER OF MIGRANTS SURVEYED FROM EACH IIT

IIT	Men	Women	Total
Madras	31	3	34
Bombay	20	1	21
Kanpur	10	5	15
Delhi	36	4	40
TOTAL	97 (88.3)	13 (11.7)	110

Note :(i) IIT, Kharagpur was not included as no address was available.

(ii) Figures in parenthesis represent percentage.

(iii) This table does not signify the relative rate of migration from these IITs. The number of migrants from each IIT who were approached varied and hence the number of responses are proportional to that number.

An overwhelming majority of these migrants were settled in USA (Table 3.15). In fact, 3 out of 5 settled in developing countries like Hong Kong had first gone to the US for higher studies and then to these countries. One of the two, who were living in Canada, had first spent three and half years - two as a student and one and half as working professional in the US..aw off

TABLE 3.15 : DESTINATION OF IIT MIGRANTS

COUNTRY	NUMBER	PERCENTAGE
USA	101	91.8
CANADA	2	1.8
EUROPE	2	1.8
OTHER DEVELOPING COUNTRIES	5	4.5
	110	100

TABLE 3.16 :DISCIPLINES OF IIT MIGRANTS*

DISCIPLINE	NUMBER	PERCENTAGE
(1) ENGINEERING		
CHEMICAL	30	27.3
ELECTRICAL	19	17.3
MECHANICAL	17	15.5
AERONAUTICAL	11	10
METULLURGY	11	10
COMPUTER	4	3.6
CIVIL	2	1.8
INDUSTRIAL MGMT	2	1.8
(2) SCIENCE		
PHYSICS	7	6.4
CHEMISTRY	7	6.4
TOTAL	110	100**

* These are disciplines in which they had degrees from IITs.

** Due to rounding off of percentage figures, they do not add up tc exact 100.

Discipline-wise distribution of IIT migrants reveal that highest percentage(27.3) had had their degrees in chemical engineering, followed by electrical and mechanical engineering. In all, 87% of these respondents had their degrees in engineering and only 13% had degrees in pure science (Table 3.16). Altogether 77% of respondents had taken graduation degree from IIT and the rest(23%) had done their masters or higher degree from IIT (not shown in the table). This, however, should be looked at carefully, before reaching the conclusion that rate of migration is higher among engineering graduates. Since the ratio of science students to engineering students is somewhat similar in IIT, this rate merely reflects that a similar proportion migrates from both the streams.

SOCIO ECONOMIC BACKGROUND

Certain questions in the survey were related to socio-economic background of these migrants like educational and professional status of both the parents, size of family, place of pre-IIT education, etc. Most of the respondents seem to have had an educated family atmosphere as fathers of 74% respondents had either graduate or higher degrees. In fact more than half (52%) of the fathers of respondents had either post graduate or professional degree. Interestingly, however, the fathers of 10% respondents had had no formal education (Table 3.17) . Among the mothers 50% had had education upto graduate or higher level. Another 28% had passed high schools and only 22% had not had any formal education. Considering the low level of literacy rate among women, especially during 1960s and 1970s, the period to which these data pertain to, this level of education among mothers of IIT migrants is certainly a remarkable point..AW OFF

Professional status of the parents show that around one-fourth of both the parents were in teaching profession (Table 3.18 and 3.19). The highest percentage (28) of the fathers of migrants, however, worked in public sector and government jobs. On the other hand, only 4 percent were in the profession of agriculture. Majority of the mothers(62%) of respondents were housewives. However, around 10% of the mothers were doctors, and 28% were teachers.

TABLE 3.17

EDUCATIONAL STATUS OF PARENTS OF IIT MIGRANTS

LEVEL OF EDUCATION	FATHER		MOTHER	
	NUMBER	%	NUMBER	%
POST GRADUATE/ PROFESSIONAL	57	52	18	16
GRADUATE	24	22	37	34
HIGH SCHOOL	18	16	31	28
NO FORMAL SCHOOLING	11	10	24	22
TOTAL	110	100	110	100

TABLE 3.18

PROFESSIONAL STATUS OF FATHERS OF IIT MIGRANTS

PROFESSION	NUMBER	PERCENTAGE
AGRICULTURE	4	4
OWN BUSINESS	18	16
SELF-EMPLOYED PROFESSIONALS*	13	12
PUBLIC SECTOR/ GOVT. JOBS	31	28
PRIVATE SECTOR JOBS	18	16
UNIVERSITY	26	24
TOTAL	110	100

* includes Doctors, Lawyers etc.

Though information regarding family's income at the time of migrants admission to IIT was also collected, it was deliberately avoided to present them in tabular form for two reasons - (i) most of the migrants felt that they have only rough idea about that as they were very young at that time, and (ii) since the period of reference is very wide 1968 to 1980 - the problem of comparability also arises. Profession of parents are better indicator in that sense and that can be taken as reflective of income and economic condition of the family.

Table 3.20 shows that majority of the respondents came from small and middle sized families. 22%, however, also came from large sized families where, there were five or more children. Table 3.21 shows that almost half of the migrants had all their pre-IIT schooling in metropolitan cities. Next 20% also had stayed in State Capitals throughout their lives before joining IIT. No migrant had had any schooling in a village..AW OFF

TABLE 3.19

PROFESSIONAL STATUS OF MOTHERS OF IIT MIGRANTS

PROFESSION	NUMBER	PERCENTAGE
HOUSEWIFE	68	62
TEACHER	31	28
PROFESSIONAL*	11	10
TOTAL	110	100

* All were Doctors

Note : Percentages have been rounded to integers.

TABLE 3.20

SIZE OF FAMILIES OF IIT MIGRANTS (PARENTAL FAMILY *)

SIZE OF FAMILY (Parents+Siblings incl. Migrants)	NUMBER	PERCENTAGE
Small (4 or Less)	42	38
Middle (5 to 6)	44	40
Large (7 or more)	24	22
TOTAL	110	100

* At the time the migrant joined the IIT.

TABLE 3.21

PLACE OF SCHOOLING OF IIT MIGRANTS BEFORE JOINING IIT MIGRANTS

PLACE	NUMBER	PERCENTAGE
VILLAGE	0	0
TOWN	35	32
CITY(State Capital)	22	20
METROPOLIS	53	48
TOTAL	110	100

On the basis of above evidences it can definitely be concluded that the migrants from IITs mainly came from highly educated, moderate sized families, mostly belonging to service class and settled in either State Capitals or metropolitan cities. These attributes have important role in having information and providing motivation due to better exposure. However, a good percentage (around one-fourth) belonged to not so educated families, coming from small town and lower middle class background. Those

coming from this background also seem to have recovered from disadvantages associated after their stay and study in IITs.

PRIVATE COSTS

Private cost for any student in any institution includes the expenditure one is incurring for that particular education plus the alternative cost, if any. The IIT migrants were asked about monthly expenditure on different heads. These vary for different respondents who had studied in different IITs and at different periods. Some variation is there even for those who were in same IIT during the same period, perhaps, reflecting the varying individual expenditure habits. They, however, expressed their inability to remember exact amounts for different heads.

Table 3.22 gives information regarding scholarship's having been received by migrants in IIT through different means. It can be seen that 44% of all the migrants had some scholarship, the rate being higher for those who had done their post graduation. All those who did M.Tech or Ph.D received scholarships, mostly through University Grants Commission (UGC). Among B.Tech graduates, except five, all received merit-cum-means scholarship from IIT which depended both on students high merit and family's low income. The rest three received it through their respective State Governments purely on the basis of merit. The migrants were also asked about the percentage coverage of their total expenditure by scholarships. Though this reflects the extent of coverage of private expenditure by social money, this also depends on personal spending habits of respondents and on their interpretation. Hence it was avoided to derive any generalised conclusion in tabular form. However, roughly 50% of the scholarship holders covered their entire expenditure during their stay in IITs through scholarship money..AW OFF

TABLE 3.22

NUMBER OF SCHOLORSHIP HOLDERS AMONG IIT MIGRANTS(in IIT)

	Undergraduate	Postgraduate	Total	%
Some Scholorship	29	15	44	40
No Scholorship	56	10	66	60
TOTAL	85	25	110	
%	77	25	100	

TABLE 3.23

PRIVATE OPPORTUNITY COST OF IIT MIGRANTS

CATEGORY	NUMBER	PERCENTAGE
(i) the expenditure at IIT was same as it would have been at any other alternative, available to them.	82	76
(ii) They would have paid slightly less (15-25%) in the available alternative.	11	10
(iii) Whole expenditure was opportunity cost, as they would have paid nothing for available alternative.	4	4
(iv) They would have paid more than what they paid in IIT in the available alternative.	13	12
TOTAL	110	100

Opportunity cost is the value of alternatives of other opportunities which have to be foregone in order to achieve a particular thing. This is an important component of total cost in any case. At the same time, it is difficult to calculate this as it involves calculation of things which have not happened in reality. To find out the private opportunity cost, the IIT migrants were asked about the best alterna-

tive to admission in IIT, which were available to them and also about the expected expenditure there. This was taken as indicative of alternative cost to a great extent, as in most cases, next best alternatives available to them was taking admission in some other engineering college. The value of a degree from any other engineering college can be taken as more or less equal or in some cases slightly less than a degree from IIT and as such if there is no difference in expenditure between the two, alternative cost can be taken as nil. Table 3.23 shows that as high as 75% of respondents felt that they would have spent more or less the same amount, if they had joined next best alternative available to them. 10% of respondents felt that they would have spent 15 to 20 percent less in the next best alternative available. In this category, the alternative available was mostly to do general science graduation degree course. 12% of respondents said that they would have spent more as the available alternative was in most cases private engineering college. Slightly less than 4% of respondents claimed that they would have paid nothing in the available alternative and the whole expenditure at IIT was their opportunity cost. This response, however, seems to have based on faulty perception. These respondents based their reply on the premise that, since the next best alternative (engineering college in three cases) was situated in their home town, they would have continued to live in their homes and hence they would not have made any expenditure. This is certainly not the correct conclusion to arrive on due to two reasons - (i) there must be some academic expenses on fees, other charges and books etc, and (ii)living expenditure on food and clothing would have continued, if nothing else and would have cost some amount. That amount however would have been lower than similar expenditure in IIT. Hence, it would be better to treat this group along with (ii) in Table 3.22, except one migrant who has expressed that he would have joined the labor force and worked instead of continuing studies. This is the only case where all the private expenditure plus his expected earnings in IIT can be taken as opportunity cost.

On the whole, the opportunity cost in case of IIT migrants seems to be negligible, if taken together for the total respondents. This is mainly because all those who enter IIT, generally have a secured admission in some other professional college and as such they spend more or less the same amount. They are able to secure admission in more than one place because they generally belong to the brighter set

of students of their age as well as due to a greater access to information available as reflected by the socio economic background.. Though certain expenditures can be less in other engineering colleges, the number of scholarship is much higher in IITs - making the amount almost similar, when taken at macro level.

PERCEPTION OF BRAIN-DRAIN

It is quite interesting to see that 60% of respondents perceived the phenomenon of international migration of IIT graduates as a real drain of resources including brains (Table 3.24). This perception is mainly based on two realisations - (i)high level of social costs involved in their education and training, and (ii)the importance of such trained personnel in the development of any country. On the other hand, 36% feel that the whole issue of brain drain is a myth and in reality, the country gains in terms of both resources and knowledge due to international migration of trained manpower. Their argument is also based on mainly on two arguments - (i) These migrants invest a good amount of finances in the country which they would have otherwise not able to do, and (ii)in some way or the other, everybody contributes in their field of knowledge. They, however, do not specify the ways in most cases. Some of them feel trained man-power are best exportable items for India and it should start thinking in those terms. There is a third category too, which considers this phenomenon to be neither drain or gain. Only about 4% of respondents fall in this category. Those in category (ii) and (iii) in Table 3.24 do not mention the significance of social costs in their education at all..AW OFF

3.4.1 COST OF A MIGRATING IIT PASS-OUT

To determine the cost of a IIT graduate is not an easy task. Total cost for any institution has four essential elements - (i) the total resources invested - both recurring and non-recurring or capital and current - in providing such educational and training facilities, (ii) the returns foregone form the best alternative for the resources spent in that education, (iii) the foregone earnings of the students time from the best alternative, and (iv) private expenses of the students spent for the specific purpose. As regards IITs, we have seen in the previous section that foregone earnings of the IIT pass-outs seem to

be either nil or negligible. The share of income through students in total recurring expenditure (it is generally used for that only) has also become less than 2% over the years.[11] The returns foregone from the best alternative for the resources spent in IITs is an important ingredient of total costs but also at the same time, very difficult to estimate. However, if it is assumed that amounts invested in IITs are a part of education sector resources, and within that sector, the returns on expenditure on any other sort of education would have produced products of similar value for the society, the alternative cost of this expenditure also can be taken as zero. In that case, what remains is the total, capital and current, expenditure.

TABLE 3.24

PERCEPTION OF IIT MIGRATNTS REGARDING THE PHENOMENON OF MIGRATION TO DEVELOPED WORLD

	NUMBER	%
(i) Consider it as a drain of resources and brains for the country(India).	66	60
(ii) Consider it as a gain of resources and brains for the country(India).	40	36
(iii) Neither (i) nor (ii) - it makes no difference to the country(India).	4	4
TOTAL	110	100

Though there is information available on capital expenditure, it is very difficult to estimate per student capital expenditure as capital investments are for long periods. Hence, what is generally calculated is per student recurring expenditure and it is assumed that total expenditure would be higher than this. During the twenty five year period of 1970-71 to 1984-85, per student recurring expenditure

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11. See Table 3.8 for detailed information.

has increased by a rate of 19% per annum, on an average, (See tables 3.2 and 3.6) at current prices. On the basis of this and number of years spent in IIT by a migrant, the total recurring expenditure on him or her can be calculated. This has not been tried here as this estimate would not be uniform for all the migrant respondents because of a long time-frame and section 3.2 provides a fair idea about that.

3.5 ROLE OF FOREIGN AID

In the establishment and development of IITs, India received handsome foreign aid from some developed countries and international agencies, mainly through bilateral agreements. The Indian Policy has been to consider foreign aid as a means of harnessing modern science and technology from the developed world for country's economic development efforts. Though the long term policy of the country has been to train our scientists and technologists, the strategy was to use foreign aid for building scientific institutions to the extent to which indigenous resources failed to meet the needs of the institutions fully.

At the time of the establishment of the first IIT, at Kharagpur in 1951, foreign aid had not entered into the Indian strategy of economic development. And hence, IIT Kharagpur was an indigenous enterprise without any foreign aid . All the equipment were imported for the specialised laboratories were bought and even the foreign exchange required to pay for them did not come from any external source in form of aid. Though qualified Indians were available for most of the faculty posts, some foreign experts were recruited in fields where suitable Indians were not available at that time. The funding for this too was based on India's own financial resources. It was only later that through some trusts and bilateral plans, the Institute received some sort of aid from external resources, that could hardly be called foreign collaboration in any way.

The formulation of the second five year plan and identification of priorities, as outlined in section 3.1 had necessitated the establishment of several more institutes of technology of advanced kind. But for this, the country neither had the required amount of foreign exchange to buy sophisticated equip-

ment nor the large number of trained and competent scientists and technologists to fill senior faculty posts. At this stage, foreign aid in its various forms had also become part of the overall national development planning process. As such, when the question of setting up more IITs within a short period of time arose, the strategy of resorting to foreign aid for this purpose was considered. Though India did not actually go with a begging bowl or even canvassed actively for aid, it explained its national development plans and priorities to all aid-giving countries. It was obvious that aid had to come from countries scientifically and technologically advanced than India.

The USSR was the first country to come forward in 1957, but India did not have any bilateral aid relationship with her at that time and hence that money was placed at the disposal of UNESCO by the USSR for the promotion of science and technology in developing countries. UNESCO considered India's case and found it suitable. In this way the USSR and UNESCO proposed and India agreed and the IIT, Bombay came into existence. The next institute to be established was at Madras in 1959 with the assistance of Federal Republic of Germany. The Kanpur and Delhi Institute then followed in 1960 and 1962 respectively with the assistance of the United States for the former and the Great Britain for the later. Foreign aid came mainly in three forms in all these cases - (a) money for equipment which were to be imported, (b) trained and qualified foreign experts as faculty members, and (c) training facilities for Indian faculty members in foreign countries.

Table 3.25 shows the quantum of foreign aid and technical assistance received by the IITs upto March 1972 vis-a-vis the capital expenditure incurred by the government of India. The Indian Government also provides the annual recurring expenditure. Table 3.26 shows the details regarding aid and assistance till 1.1.79 along with the schemes under which the assistance came. Table 3.27 reveals Indian share in capital expenditure in IITs (non-recurring) for all the IITs. Since foreign aid came also in terms of faculty members and fellowships and training of Indian faculty members abroad, it is difficult to calculate the real total value. However, these evidences suggest that in cases of IIT, Madras and IIT, Delhi, the amount and share of foreign aid in total expenditure has been quite high in initial years whereas it was not so high in cases of IIT, Kanpur and IIT Bombay. IIT, Kharagpur as pointed out earlier received

the least amount of foreign aid.

TABLE 3.25

GOVERNMENT OF INDIA CONTRIBUTION AND FOREIGN AID IN IITs EXPENDITURE
(upto 31st March, 1972)

(In million Rs.)

	IIT DELHI	IIT BOMBAY	IIT KANPUR	IIT MADRAS
1. GOVT OF INDIA CONTRIBUTION. (In Rs.million)				
(i) Land & Buildings	57.16	59.49	73.53	69.13
(ii) Equipment, Library, Furniture & Fittings.	18.56	46.26	34.64	18.83
TOTAL	75.72	105.75	108.17	87.96
(iii) Recurring Expendr. per year.	13.28	16.96	18.53	15.23
2. FOREIGN AID				
(i) Equipment	Rs. 13.24 million (Rs. equivalent)	Rs. 21.58 million	$ 7.42 million @	DM 30.29 million
(ii) Experts	No:126	No:132	PS 5.92 million No:122	(Man Years)
Man Months	78	2169	2266	221
(iii) Fellowships	No:78	No:63	No:47	(Man Years)
Man Months	1490	1885	543	97
			$0.29 @ million	

@ Excludes rupee expenditure from US Trust Funds.
PS means Pound Sterling.

Source : Parkinson, Nancy; Educational Aid and National Development Macmillan, 1976; pg.218

TABLE 3.26

QUANTUM OF FOREIGN AID/TECHNICAL ASSISTANCE RECEIVED BY IITs TILL 1.1.1979

IIT	SCHEME	Equipment (Rs. in lakhs)	Guest faculty from abroad		Indian faculty training abroad	
			No.	Man-months	No.	Man-months
1. Delhi (Estd: 1961)	1. Indo-UK Collaboration	575.00	184	1072	144	1895
	2. Indo-Swiss Collaboration	19.00	7	25	7	46
	3. Indo-Norwegian Collaboration	6.59	2	2	7	18
	4. Indo-French C.E. Programme	8.00	21	15	17	79
	5. P.L. 480	9.75	-	-	-	-
	6. Other Programmes	4.67	-	-	-	-
TOTAL	6 Schemes	623.01	214	1114	175	2038
2. Kanpur (Estd: 1960)	Kanpur Indo-American Programme	373.19	120	2226	49	500
3. Madras (Estd: 1959)	1. Indo-German Collaboration	1025.00	75	2254	117	1264
	2. Irish Govt. Equipment Aid	21.00	-	-	-	-
	3. Indo-French C.E.Programme	----- Brief stray visits -----			6	36
TOTAL	3 Schemes	1046.00	75	2254	123	1300

CONTD....

IIT	SCHEME	Equip-ment (Rs. in lakhs)	Guest faculty from abroad		Indian faculty training abroad	
			No.	Man-months	No.	Man-months
4. Bombay (Estd: 1958)	1. UNESCO Aid Programme (Old Rouble Currency Funds)	171.00	82	1512	27	810
	2. Indo-USSR Collaboration	60.00	54	840	-	-
TOTAL	2 Schemes	231	136	2352	27	810
5. Kharagpur (Estd: 1950)	1. Indo-USSR Credit	29.58		102		120
	2. 12 Million Dollar USA Equipment Fund	17.26				
	3. TCM Equipment Fund	39.67		60		387
	4. Alexander-Von -Humboldt Foundation Equipment Aid	2.93				
	5. Colombo Plan 1952-59	7.30		12		63
	6. Ford Foundation Fund	9.92		46		90
TOTAL	6 Schemes	106.66		220		660

Source : Report of the Committee on review of foreign technical assistance received by the Indi Institutes of Technology (Chairman: Prof. Y. Nayudamma) 1980.

TABLE 3.27

INDIAN CAPITAL INPUT IN IITs (NON-RECURRING ITEMS SUCH AS RENT ON LAND, BUILDINGS, EQUIPMENT ETC.)(UPTO 1.1.1979)

INSTITUTE	INDIAN INPUT (Rs in lakhs)
IIT, Delhi	900.00
IIT, Kanpur	1345.54
IIT, Madras	1400.00
IIT, Bombay	907.00
IIT, Kharagpur	1257.53
TOTAL	5810.07

Source : Parkinson, Nancy; Educational Aid and National Development Macmillan, 1976; pg.218

As stated earlier, all the requirements of the IIT Bombay were met by the USSR through UNESCO. Almost all the equipment and experts came from the USSR and the Indian faculty were also trained in that country. UNESCO also provided a small dollar grant for the services of experts from other countries to give the project an international colour. For IIT Kanpur, Indo-American programme came to an abrupt end in 1972 due to adverse Indo-US political relations and the expected post-project collaboration did not follow. Though except IIT Kanpur, all the IITs received some aid from sources other than the main collaborating country, the amounts so received remained insignificant compared to aid received by collaborating country. Table 3.27 shows the corresponding Indian capital input which is also highest for IIT Madras and lowest for IIT Delhi.

There is no doubt about the fact that foreign collaboration and technical assistance has had a significant impact on the IITs and in turn on the technical education system in the country. By itself, India would have taken much longer time to achieve this goal, as pointed out by Parkinson(1976):

> India established the first institute of Technology at Kharagpur in 1951 all by itself. Almost eight years passed before the next institute started at Bombay in 1958 but the Madras, Kanpur and Delhi Institutes all came into being within about five years. It is therefore evident that the role of foreign aid was to accelerate the process. If India had to establish and develop all these institutes all on its own, it would have involved a large outflow of foreign exchange for equipment and for the training of Indian faculty abroad. It would have taken India many long years to meet the foreign exchange needs of the institutes from its own resources.(Parkinson, Nancy; 1976)

The induction of latest Western technology into the Indian institutes was another significant contribution of these collaborations. Scientists, engineers and technologists produced by IITs are of very high calibre, comparable to the very best produced anywhere in the world. Foreign collaborations in IITs, however, have been criticised and their positive role has been questioned on many grounds. The impact of equipment have been criticised on two points - (i) problems of spares and obsolescence, and (ii) restrictions on import of equipment. The Review Committee which looked into the question of Foreign Technical Assistance received by the IITs looked into the question and provided some factual information regarding these problems. As regards spares, the report shows that though IITs at Kanpur and Madras did not have any difficulty, the IITs at Bombay, Kharagpur and Delhi faced problems in this regard. The IIT Kanpur had ordered adequate spares alongwith the equipment and in case of the IIT Madras, the continuing nature of the agreement with Germany took care of the problem. The worst affected Institutes are those of Bombay and Kharagpur whose collaboration with foreign countries expired long ago. The IIT, Delhi also reported that many items of imported equipment were lying idle because of lack of spares. These facts, in a way, confirms the criticism regarding problems of spares. They also show lack of foresightedness of Indian negotiating teams of experts.

Several limitations and restrictions were also experienced regarding the choice and source of equipment:

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12. Report of the "Review of Foreign Technical Assistance received by the Indian Institutes of Technology etc."; (Chairman - Prof. Y. Nayudamma) 1980.

> Under the Indo-UK collaboration agreement in respect of the IIT Delhi only equipment of UK origin could be ordered. IN the case of Indo-American Programme for the IIT Kanpur the stipulation was that when available the equipment should be purchased from the American market. The IITs at Kharagpur and Madras did not seem to have had these problems. All items of equipment were supplied as specified by them. The IIT Bombay did not have any choice or say in the selection of equipment (it) got from the USSR. This has created lots of difficulties. Many items of equipment were not at all of the laboratory type and hence, were unfit for instructional and research purposes. (Nayudamma Committee Report, 1980).

Regarding information on spares and usefulness of equipment received through foreign aid in IIT; we have mainly relied on Nayudamma Committee Report because that was considered to be most authentic document on the role of foreign technical assistance by all IITs. The above discussion reveals that there were certainly some limitations and problems associated with the equipment which IITs received in form of aid from foreign countries. These problems, mainly arising due to conditionalities attached, vindicate the criticisms. However, as mentioned earlier, the negotiating Indian teams could have foreseen some of these problems and incorporated some terms in agreements accordingly.

Regarding guest (foreign) faculty the Nayudamma Committee Report (1980) felt that, by and large, they were of good calibre and made effective contributions to the progress and development of these Institutes. The IITs in Delhi, Kanpur and Madras had a say in the selection of foreign faculty and therefore, they could choose the right people based on their own requirements. In contrast, the IITs at Kharagpur and Bombay were neither asked nor consulted and to that extent had to face some problems.

The more serious indictment against the IITs, however, is regarding curricula and orientation. The training, it is alleged, is elitist in character and is based on alien culture oriented towards the needs of the developed countries. The trend of education imparted in the IITs is said to be irrelevant to the immediate development needs of the country. Though from the very beginning, it was made clear that foreign experts for each Institute would have no responsibility in the administration and management, their role and power in curricula development was undeniably very elaborate. Their, in fact, main job was to introduce new curricula, new systems of evaluation and instruction and ultimately to train Indian faculty to take all these responsibilities. This, added by the training of Indian faculty abroad, obvi-

ously, gave the training in IITs a Western orientation. This approach and orientation are also alleged to be one of the important reasons of high rate of emigration of IIT graduates to the Western countries. It is quite true that over emphasis on foreign exposure - in terms of technology, curricula, instruction and training- has been an abetting factor to the emigration of IIT graduates to western countries, as brought out by many survey reports (Sukhatme & Mahadevan, 1986; Ananath, Natarajan & Ganesh Babu, 1989; IIT Review Committee Report, 1986).

In this context, it becomes desirable to compare briefly the curricula development in Masachusettes Institute of Technology (MIT) in the US vis-a-vis that in IITs, as the later was mainly modelled on the line of MIT. The MIT has developed a number of centres, other than engineering, ranging from humanities & social sciences to real estate development and from management to Health science. These centres offer courses in wide areas of learning and there is a great scope of selecting courses from different schools. For example, inter departmental courses like 'Science, Technology and Society' emphasises the role of social, cultural and technological development or a course in advanced visual studies combines concepts of art, science and technology to explore new artistic forms. A course in biomedical engineering combines nuclear engineering and medicine. There are opportunities for a student to complete a major degree in science or engineering complemented by a minor programme in humanities, arts or social sciences. The MIT also provides for several options like double majoring or joint majoring where courses from two fields can be done together. This system of curricula helps to give the students a wider perspective and a better understanding of any problem.

The IITs, on the other hand, have failed to a great extent in developing such curricula. They have remained, more or less, confined mainly to technology and at the most have put some emphasis on science. Management and social sciences, especially the later, has totally lagged behind. Though science has an importance in IIT curricula, "over the years the importance originally given to science and engineering science is perhaps whittled down" (IIT Review Committee Report 1986, pg.22). Within engineering courses also, actual industrial practices have less emphasis. To quote IIT Review Committee Report (1986)

again :

> IIT curriculum has distanced itself from actual industrial practices and IIT students are likely to have a cultural shock when they go to the shopfloor. This is probably why most of them do not go into technological areas best prefer to go abroad to take up management posts.

Management, in recent years, has found a bigger space in curricula in some of the IITs, as an analysis of the course of studies show. Social sciences and humanities is mainly limited either to those who are pursuing research degrees in these fields or to teaching English to freshers in engineering courses. This has certainly helped in alienating IIT students from the social realities of the country which could help them discover appropriate technologies for Indian conditions. Nevertheless, some of the IITs are trying to do the desirable changes in the curricula as has been emphasised by many studies. IIT Review Committee Report (1986) records that IIT Kanpur has recognised the need for incorporating a substantial dose of basic sciences and humanities in the engineering curriculum in accordance with their objective of developing a science-based engineering as their strength and IIT Bombay has developed innovative programmes taking into account the changes occurring in industry around them. IIT, Delhi, has also introduced some changes to include a minor course alongwith major course of specialisation, in graduate (B.Tech.) programme. These are, however, far from desirable from the point of view of developing perspective which could help them decide to stay back in their own country.

Sometimes, the developed countries are alleged to have deliberately used the policy of providing foreign aid to Institutes like the IITs in developing countries in order to create what Kabra (1976) would call an "industrial reserve army". The argument for the above view runs on the following line - Modern science and technology needs an uninterrupted supply of scientists and technologists and developed countries face a shortage of hqm. By redesigning their immigration and aid policy they try to fill the gap. They provide aid for specific education to developing countries that are generally over populated and resource deficient. These developed countries also redesign their immigration policy to make it suitable for hqm immigration and with the help of high income differentials succeed in attracting these trained hqm to their countries. Developing countries feel they have increased their welfare with help of aid but in

reality they lost in many ways - crucial matching resources which they had put in furthering such education, technology which they could have produced with the help of hqm and also a capability to borrow and assimilate foreign technology.[13] In the whole process developed countries are said to have gained much more than their initial cost in form of aid and developing countries are said to have lost the crucial resources.

The crucial question which arises from the above argument and remains unanswered to a great extent is whether the country which receives aid has become worse off as compared to no aid situation or as compared to post aid situation in which the benefits of aid are not being diverted or diluted in some form. A related question that concerns conditionalities attached to aid is whether the benefits accruing to aid receiving countries are greater in absence of conditionalities. These alternative situations can be shown with the help of following model.

Suppose a country A is relatively underdeveloped and operating under autarky. TT is the product possibility or product transformation line and AB is the price or budget line of the country. ICa is the community indifference curve, derived by lateral summation of individual indifference curves.[14] Q is obviously the situation of maximum welfare as it is the tangency point. Here, even though AB is budget line of the community, its choice is limited to TT as areas AQT and BQT remain outside the product transformation curve. Now if the country decides to enter into trade with the rest of the world and there is no difference in the domestic price and world price, AB will continue to be its price line. However, in this case, the community's choice will not be bound by its production possibility curve and, due to changed situation, a new community indifference curve will be derived which might intersect the old one, as in

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13. See Kabra K.N.; "Political Economy of Brain Drain", Arnold Heinemann, 1976, New Delhi, for detailed argument.

14. What is implicit here is that the existing distribution of income is taken as acceptable.

Figure 3.2 : Foreign Aid and Social Welfare

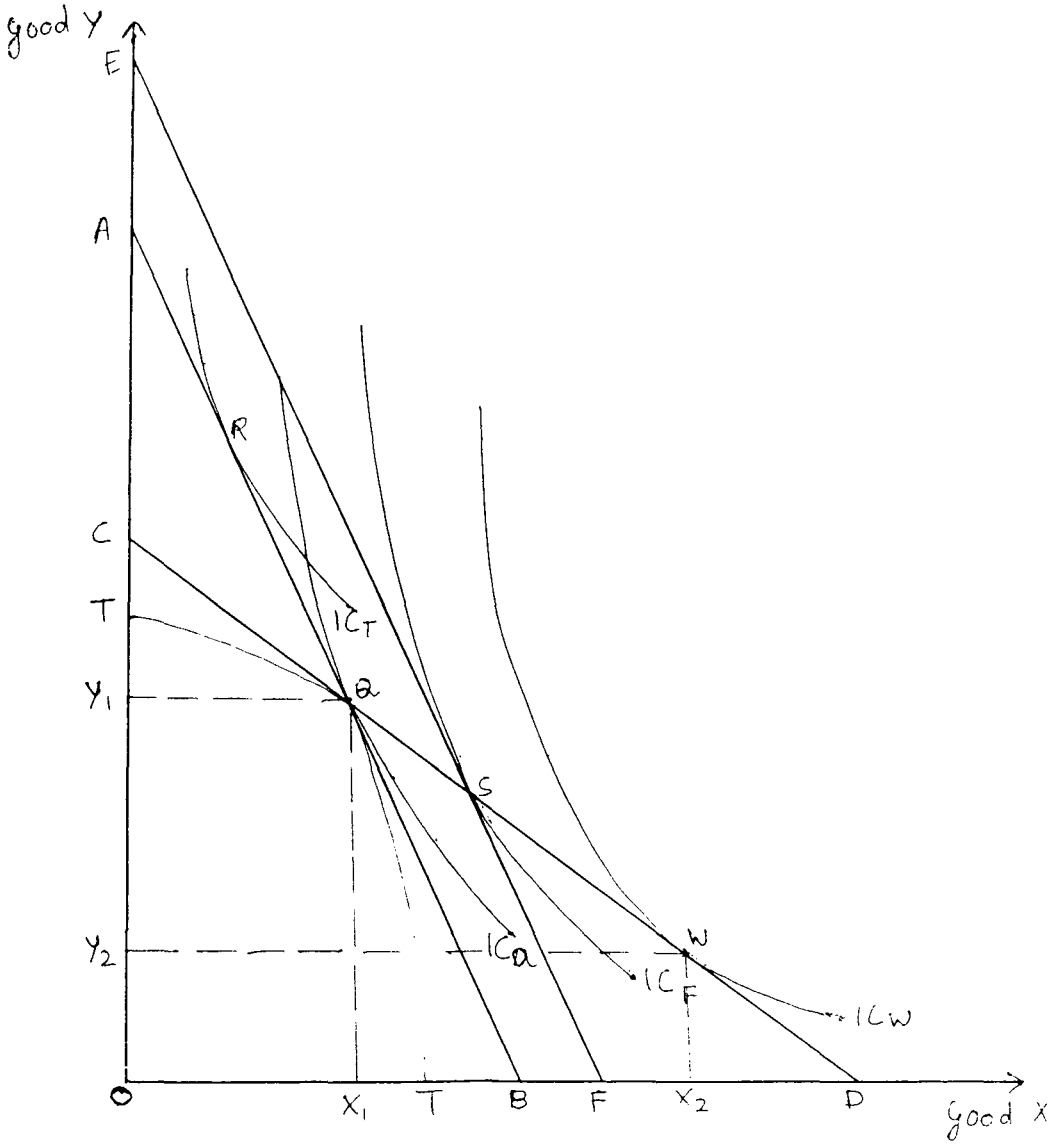

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Figure 3.2 ICt intersects ICa and is tangent to AB at a point lying above TT. Though the two points of tangency lie on the same price line, a shift form QR to R can be considered as an addition to welfare, as it involves extension of choice.

It seldom happens that there is no difference in the prices of goods in the world market. Hence, in case of price differences, the county A would face a different price line say, CD in Figure 3.2. The country can now enhance its welfare by moving from ICa to ICw. The new equilibrium point is W, where country A is importing X_1X_2 of good X and exporting Y_1Y_2 of good Y. Now, suppose, the country receives foreign aid equal to AE. In this case, though the country will improve upon its situation of autarky, the level of welfare will be worse than the free trade situation. In the diagram, price line AB has moved to its parallel EF (eg. amount of aid) and community indifference curve from ICa to ICf. This would not happen only if the amount of aid received is very large. This does not happen usually and in fact, the price or budget line will not move by the full amount of aid to the extent the conditionalities are restricting to its free use. In an extreme case, if the increase in production caused by aid is being diverted to other countries at low or no price, the aid might lead to a situation where the price line is even below the original autarky price line and the country is worse off than original situation.

In the context of aids received by IITs, it has already been discussed that in most cases there were restrictions in matters of choice of equipment as well as experts, and to that extent the real value of aid was reduced. Besides, on the first place, the total amount of aid, though substantial, was always less than half of the total capital expenditure. This is to say that indigenous resources had a bigger share in establishment and growth of IITs. The question, however, is more important for technology viz, whether it was possible for the country at that time to buy the kind of technology it received through the

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15. This has become possible because the curve in community indifference curve and not the individual indifference curve.

aid. The answer is not straightforward but considering the fact that movement of technology has certainly not been operating in the free market it does not seem to have been probable for India at that time to buy that kind of technology. Hence, it would not be unreasonable to conclude that, though the foreign aids to IITs resulted in certain problems, on the whole, they helped the institutes to grow in early years.

Foreign aid also come in shape of foreign faculty and training of Indian faculty abroad leading to a western orientation in the curricula followed by the IITs. This has also been partially held responsible for abetting migration of IIT products to developed countries and thereby reducing the country's critical products of hqm to that extent. This point has been discussed earlier in detail. Though the charge is true to a certain extent, the Indian faculty members and IIT administration are no less responsible for not molding the IIT curriculum and programmes according to the needs of the country. However, here it becomes more pertinent to discuss whether the migration of IIT products or any hqm for that matter, are a total loss to the sending country. This question has been discussed in detail in subsequent chapters. Another noticeable point is that, many factors, other than curricula, are responsible for migration of hqm and hence, it would not be justifiable to discuss the phenomenon only in this context. Even to evaluate the role of foreign aid, it is important to analyse other related factors, as foreign aid policy does not function in isolation.

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CHAPTER IV

DEMAND FOR HQM : AN ANALYSIS OF IMMIGRATION POLICY AND LABOUR MARKET TRENDS IN THE UNITED STATES

The phenomenon of HQM migration has often been discussed in terms of push and pull factors mainly emphasising income differentials and gaps in opportunities. The studies dealing with IIT migration have also primarily expanded on the same line.[16] Though the importance of these determinants cannot be denied, it is also true that they are only necessary conditions but not sufficient to explain the phenomenon in modern world. The world today does not function in a laissez-faire situation where there is no restriction on the flow of HQM from one country to another. On the contrary, there exists a number of restrictions and guidelines controlling the flow of HQM in the form of immigration policies for most of the countries, especially those that have been receiving large number of immigrants. Besides, labour market conditions in receiving countries play a major role in migration of HQM. There has to be jobs available or probability of it in the receiving countries that commensurate with the education and training of HQM in order to attract and retain them. Social acceptability in the receiving country is also important. This chapter analyses the immigration policy and labour market trends in the USA and their implications for Indian HQM migration. USA has been singled out as that is the main destination of emigrating Indian HQM in general and IIT graduates in particular, as seen in previous chapters.

4.1 US IMMIGRATION POLICY

4.1.1 RESTRICTIVE LEGISLATIONS AND EARLY INDIAN IMMIGRATION:

Though we are mainly concerned with the analysis of the US immigration policy with reference to Indian HQM immigration, in order to understand and analyse the trends in the development of that policy, one needs to go briefly into historical background. Technically speaking, the US immigration policy began with the declaration of Independence in 1776 and Treaty of Paris in 1783, which accorded the Unites States

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16. See Chapter 2 for detailed account of these studies.

recognition as a nation but official immigration statistics began to be kept in 1820. However, the settlers and pioneers who colonized North America before the founding of the United States were also immigrants. These early immigrants came from a variety of nations, primarily from Western Europe, and for a variety of reasons. The USA needed people for settlement, defence and economic development and hence immigration was widely encouraged till mid-nineteenth century.

Until mid-nineteenth century, when the Chinese arrived in the US in large numbers followed by the Japanese, very few Asians entered the US. Although there were a few Indians reported in some parts of the US as seamen and merchants, statistically significant migration of Indians began just after 1900.[17] Like other Asian immigrants, Indians also comprised mainly agricultural and unskilled labourers, and filled the needs of growing economy. However, with longer hours of work and lower wage demand, they were seen as a threat to local American labour and this led to the passing of a number of restrictive legislations during the period, aimed to control the Asian immigration. Chinese Exclusion Act, passed in 1882, barred the entry of labourers from China for ten years. The most interesting fact about the act is that this barred only the entry of labourers and not that of teachers, students, merchants, diplomats reflecting the welcoming attitude of policy towards human capital content even at that time. In 1917, the US Congress created an "Asiatic Barred Zone" declaring natives of China, South and South-East Asia (including India), the Asian part of Russian, Afghanistan, Iran, parts of Arabia, and the Pacific and South-east Asian islanders not owned by the US inadmissible. The Quota Act of 1921 established immigrant quota for each admissible nationality based on its share of the US population, covered in the 1910 census. This was obviously meant to restrict fresh immigration mainly to traditional source countries, viz. Western Europe. The final restrictive legislation was passed in 1924 in the form of National Origins Act which was imple-

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17. Kitano and Daniels; "The Asian Americans - Emerging Minorties" Prentice Hall, New Jersey, 1988, pp 89-90.

mented in 1929. While putting no bar on immigration from Western hemisphere, it barred the entry of all "aliens - ineligible for citizenship" which effectively excluded all Asians. For the rest of the world it fixed percentages, allotting different shares to different parts. As a result of these restrictive legislations, not very significant immigration from India to the US took place during early 20th Century. Besides, the Indians in the US at that time were mainly uneducated or less educated workers. By 1940, only around 4 percent of Indians in the USA were professionals, nearly half were farmers or farm managers, an additional 20 percent were engaged in non-form labour. More than one third of total Indians had not completed even one year of schooling. The educational attainment of the Indians was, in fact, lower than that of any other social or ethnic group in 1940 census.[18]

4.1.2 OPENING OF THE DOOR AND LATER INDIAN IMMIGRATION :

The 1940s saw a change in the American Immigration Policy towards Asians, mainly guided by political considerations. The change began with the repeal of Chinese Exclusion Act in 1943 when China had become an ally in World War II. In July 1946, President Truman signed a bill which made Indians eligible for American citizenship by giving an annual quota of a hundred and thus ended the virtual exclusion of thirty years. However, the major change in the policy came with recodification and revision of immigration and nationality laws in 1952 which later culminated in Immigration Act of 1965. The Immigration and Nationality Act of 1952, however, retained the quota of only hundred each for all the countries of Asia Pacific triangle. The most important point of the 1952 Act was introduction of a four category selection system. Highly skilled immigrants whose services were immediately needed in the US (plus their spouses and children) could claim upto half the visas assigned to each country. The remaining three

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18. See Hess, G.R; " The forgotten Asian Americans : The East Indian community in the United States : Pacific Historical Review, No.43, 1974, pp 577-96, for detailed information regarding early Indian Immigrants in the US.

preferenced categories were divided among specified relatives of the US citizens and permanent resident aliens. Thus this act established a preference order which became the antecedent of the current preference system.

The 1965 Act : The process which was started by 1952 Act, culminated with the passing of Immigration Act of 1965 with serious implications for immigration from Asia. It abolished the Asia Pacific Triangle and raised the annual quota for Eastern hemisphere immigrants to 1,70,000 with no more than 20,000 from any one country. For the first time in history, a ceiling of 1,20,000 per year was put on total Western hemisphere immigration. Thus two major regions - Asia and Latin America - became two major source areas for post 1965 immigration into the USA. The Act also brought changes of far reaching consequences in he preference system shifting the emphasis from skill to family reunification. The preference system was as follows :

(i) First Preference : Unmarried sons and daughters (over age 21) of the US citizens (maximum of 20 percent).

(ii) Second Preference : Spouses and unmarried sons and daughters of aliens lawfully admitted for permanent residence (20 percent plus any number not required for the first preference).

(iii) Third Preference : Members of the professions and scientists and artists of exceptional ability (maximum of 10 percent).

(iv) Married sons and daughters (over age 21) of the US citizens (10 percent) plus any number not required for first three preferences.

(v) Fifth Preference : Brothers and Sisters of the US citizens (24 percent plus any not required for the first four preferences.

(vi) Sixth Preference : Skilled and Unskilled workers in occupation for which labour is in short supply (maximum of 10 percent).

(vii) Refugees : Removed in 1980 and a quota of 6 percent transferred to second preference.

(Note : Spouse and minor children (under 21 years of age) of a visa reciepient normally receive the same category of preference visa).

Subsequent amendments were made in 1976, 1978 and 1980. The Refugee Act of 1980 eliminated

refugees as a category of the preference system and set the worldwide ceiling of 2,70,000, exclusive of refugees, and with per country restriction of 20,000 persons. Besides, some immigrants were exempted from the worldwide ceiling which included the following categories :

(i) Immediate relatives of the US citizens - Spouses, Children under 21 years of age and Parents, at least 21 years of age.

(ii) Refugees as per adjustments.

(iii) Special Immigrants : Certain ministers of religion, certain former employees of the US government abroad, certain persons who lost the US citizenship and certain foreign medical graduates.

(iv) Babies born abroad to legal permanent residents.

(v) Aliens who have unlawfully resided in the US since January, 1972.

TABLE 4.1

ASIAN IMMIGRATION TO THE UNITED STATES (1850-1990)
(percent of total immigration into the US)

PERIOD	ASIAN IMMIGRATION
1851-60	1.6
1861-70	2.8
1871-80	4.4
1881-90	1.3
1891-1900	2.0
1901-10	3.7
1911-20	4.3
1921-30	2.7
1931-40	3.0
1941-50	3.1
1951-60	6.1
1961-70	12.9
1971-80	35.3
1981-90	44.0

Source : For 1851-1980 INS Stastical Yearbooks (different years) as given in Bouvier and Gardner (1986) pg.8 and for 1981-90, Stastical Abstract of the United States, 1992, Bureau of the Census, United States.

TABLE 4.2

INDIAN IMMIGRATION TO UNITED STATES (1950-1990)

YEAR	NUMBER
1950	121
1951	109
1952	123
1953	104
1954	144
1955	194
1956	185
1957	196
1958	323
1959	351
1960	391
1961	421
1962	545
1963	1173
1964	634
1965	582
1966	2458
1967	4642
1968	4682
1969	5963
1970	10114
1971	14317
1972	16929
1973	13128
1974	12795
1975	15785
1976	17500
1977	18636
1978	20772
1979	19717
1980	22607
1981	21522
1982	21738
1983	25451
1984	24964
1985	26026
1986	26227
1987	27803
1988	26300
1989	31200
1990	30700

* Immigrants are classified as Indians by last permanent residence from 1950 to 1959 and by birth thereafter. Figures include both "subject to and exempt from limitation of US law.

Source : US Bureau of the Census and Immigration and Naturalisation Service. For 1950-1984, as given in Arnold, Minocha and Fawcett(1987). For 1988-90, as given in Statistical Abstract of United States, 1992.

The Acts and amendments passed in 1980s mainly dealt with illegal immigrants and refugees - hence not of any relevance for Indian immigration. In 1990, the Immigration Act was passed which represented a major revision of the Immigration and Nationality Act, which had remained the basic immigration law till then. However, before analysing the important provision of the 1990 Act, we would first examine the trends in quality and quantity of Indian immigration having taken place between the period 1965-1990. After the 1965 reforms, immigration from Asia, the Caribbean basin and South Africa rose significantly - The share of Asians in total immigration rose from a meager 3 percent in 1930s and 1940s to 44 percent in 1980s (Table 4.1). The immigration from India started rising significantly and crossed the 30,000 mark in late 1980s (Table 4.2). According to 1980 census, the Indians ranked fourth among Asian population which constituted around 11 percent of total Asian population (Table 4.3). Along with a phenomenal rise in number of Indian Immigrants to the USA another change, perhaps more significant, was witnessed in the quality of these immigrants. These new immigrants were totally different from early Indian Immigrants in their background, education, training and occupation. Unlike early Indian immigrants, these new immigrants were mostly English speaking, highly educated and professionally qualified people - obviously belonging to the category of highly qualified manpower.

In order to trace the trends in Indian immigration to the USA, both quantitatively and qualitatively, there also arises the need to consider the preference category under which an immigrant has been granted visa.[19] A look at Table 4.2 reveals that Indian immigration started increasing at a very high rate towards the end of sixties, and more or less, maintained the trend all through seventies. However towards the end of 1970s, it seems to have stabilised at around 20,000 mark for some years, after which it again rose to 25,000 mark in 1983 and remained around that level till 1989 when it crossed 30,000 mark. The percentage of principal immigrants admitted under occupational preferences, however, did not show the

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19. Unfortunately, statistical books published by Immigration and Naturalisation Service, USA, per year and Bureau of Census Reports - USA - two main documents for relevent information are not available or accessible in India. This has severely restricted the analysis to the information taken from these official sources by other secondary sources.

TABLE 4.3

ASIAN POPULATION IN UNITED STATES : 1970, 1980

UNITED STATES	1970 NUMBER	1970 PERCENT	1980 NUMBER	1980 PERCENT
Total Asian Population	1426148	100	3466421	100
Chinese	431583	30.3	812178	23.4
Filipino	336731	23.6	781894	22.6
Japanese	588324	41.3	716331	20.7
Asian Indians	-	-	387223	11.2
Koreans*	6950	4.9	357393	10.3
Vietnamese	-	-	245025	7.1
Other Asians	-	-	166377	4.8

* The 1970 data on Koreans excluded the State of Alaska

"-" Not Available

Source : US Bureau of the Census, 1980 and Asian and Pacific Islander Population by State, 1983. As given in Patel (1988).

same trend (Table 4.4) This percentage kept rising till mid 1970s and then falling during late 1970s and early 1980s. Thereafter, towards the end of 1980s, it has again shown a rising trend. Table 4.5 shows both the number and percentage of Indian Immigrants admitted into the USA under different categories over the years. The share of immigrants admitted under family preferences has increased from only 25.4 percent during 1970-74 period to around 80 percent during whole of 1980s. This dramatic increase, however, is more due to shift of non preference immigration to family preference category and less due to fall in occupation related categories. The decline in share of occupation related immigration categories, however, has led some studies to believe that the brain drain or the migration of HQM from developing countries

to the US has fallen.[20] But this proposition overlooks certain crucial aspects of the US immigration policy because of which data on only occupation related immigration preferences cannot be taken as revealing the immigration of HQM.

TABLE 4.4

IMMIGRANTS ADMITTED INTO USA UNDER 3rd AND SIXTH OCCUPATIONAL PREFERENCES : SELECTED YEARS
(percent of total immigrants)

Region & Country of Birth	YEAR OF ADMISSION						
	1970	1975	1980	1985	1986	1987	1989
All Immigrants*	8.4	7	3.9	3.9	3.9	3.9	-
Asia	12.8	8.4	3.2	4.1	4.1	4.1	2.1
India	14.8	18.6	7.7	7	4.9	9.1	12.3
Korea	6.9	6.7	1	2.6	2.8	1.1	10.5
Phillipines	20.5	11.7	0.3	2.7	2.7	3	8.6
Latin America**	-	-	2.5	2.5	2.2	2.4	-
Mexico	-	-	0.1	1.5	1.4	1.2	-

* Eastern hemisphere only, i.e., excluding Latin America and also Mexico

** Latin America includes Mexico, the Caribbean, Central America & South America.

"-" Not Available.

Note : Figures are only for principal immigrants. Do not include spouses and children

Source : Immigration and Naturalization Service Stastical Year book and Annual Reports (different years). For 1970-1985, cited by Bouvier and Gardner (1986) and for 1986 and 87 cited by Khadria(1990).

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20. See, for example, Coombs, Philip H, The World Crisis in Education : The View from the eighties; Oxford University Press, New York,; 1985.

TABLE 4.5

INDIANS ADMITTED AS IMMIGRANTS TO UNITED STATES (SUBJECT TO NUMERICAL LIMITATION OF 20,000 PERSONS PER YEAR MAXIMUM) BY PREFERENCE CATEGORY (1970-1989).

PERIOD	TOTAL IMMIGRANTS	FAMILY PREFERENCES					OCCUPATIONAL PREFERENCE					REFUGEES			NON-PREFERENCE IMMIGRANTS & OTHERS
		TOTAL	I	II	IV	V	TOTAL	III PREF. PRINCIPAL IMMIGRANT	DEPENDENTS	VI PREF. PRINCIPAL IMMIGRANT	VI PREF. DEPENDENTS	TOTAL	VII PREF. ADMITTED	DEPENDENTS	
1970-74	63961	16224	15	12617	88	3504	16789	7066	5385	2505	1833	9	5	4	30939
1975-79	89841	53055	51	23765	305	28934	21815	8190	7352	3914	2359	25	20	5	14916
1980-84	92460	75385	97	26654	912	48022	16752	7248	6898	1416	1190	61	-	1	22
1985	18833	15544	16	7458	322	7748	3288	1791	1420	35	42	41	-	-	1
1986	18474	15945	22	6576	404	8914	2553	974	966	303	310	35	-	-	5
1987	19325	14705	27	7540	569	6569	4602	2483	2006	48	65	23	-	-	18
1989	20003	15916	37	7542	882	7455	3830	2102	1680	11	37	-	-	-	23 *

CONTD....

	PERCENTAGE														
1970-74	100	25.4	-	19.7	0.1	5.5	26.3	11.1	8.4	3.9	2.9	-	-	-	-
1975-79	100	59.1	0.1	26.5	0.3	32.2	24.3	9.1	8.2	4.4	2.6	-	-	-	48.4
1980-84	100	81.9	0.1	28.8	1	51.9	18.1	7.8	7.5	1.5	1.3	-	-	-	16.6
1985	100	82.5	0.1	39.6	1.7	41.1	17.5	9.5	7.5	0.2	0.2	0.2	-	-	-
1986	100	86.2	0.1	35.6	2.2	48.3	13.8	5.3	5.2	1.6	1.7	0.2	-	-	-
1987	100	76.1	0.1	39	2.9	34	23.8	12.8	10.4	0.2	0.3	0.1	-	-	0.1
1989	100	80.5	0.2	38.2	4.5	37.7	19.4	10.6	8.5	0.1	0.2	-	-	-	0.1

- Implies negligible
* includes refugees

Source : US INS data from Annual Reports, Stastical Yearbooks (various years) as given in Minocha(1987) for period 1970-84 for period 1985-1987 as given in Khadria(1990) and for 1989 as given in Gardner (1992).

Unfortunately, the available evidences do not tell us about the education level of immigration entering through family visas, for that would have been the more reliable information regarding HQM migration. It is quite probable that majority of those who enter through family visas are themselves well trained and intend to join labour force in the US. The US Government doe not seem to be unaware of this, as is revealed by one observation of National Commission for Manpower Policy :

> Most immigrants who came before 1965 as workers were probably joining relatives, while most of those who now come on the basis of family ties enter the labour market soon after entry (Manpower and Population Policies in the Unites States, No.20 (GPO, 1978)[21]

The entry on the basis of various preferences, thus cannot be taken as the real indicator of HQM migration. To quote Bouvier and Gardner -

> That family reunification determines all but a small fraction of current legal immigration does not mean that today's legal immigrants are unemployable or poorly qualified to take part in the American economy. Far from it. Many of them come from families of individuals who came under work related preferences and hence are likely to be well-trained themselves. There is also 'selection' at the origin even apart from family connections; generally only the better educated and better trained can hope to pay for and negotiate the hurdles that lie in the path of someone wishing to immigrate legally to the US today (Bouvier and Gardner; 1986, pg.18).

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21. As given in Morris Milton D; Immigration - The Beleagured Bureaucracy; The Brookings Institution, Washington DC, 1985, pg.56

The family preference system of 1965 had great potential for chain migration which required very few persons for initial network. Asians used this for the increased migration to the USA in post 1965 period. The following example makes it obvious:

> First, an Asian student comes to America as a non-migrant to complete his education, while finishing his studies, he finds a job, gets labour department certification and later becomes an immigrant. Once an immigrant, he uses the second preference to bring over his spouse and children. A few years later, the new immigrant and his spouse become nationalised citizens and eligible to sponsor their brothers and sisters under the fifth preference or to bring their non-quota parents or other relatives. Needless to say, the brothers and sisters, once immigrants can also use the second preference to bring in their spouses and children and expand the immigrant kin network further when they become citizens (Reimers, 1985).

A careful look at above example reveals that apart from various preferences under numerically limited immigration, non-quota immigrants are another important source of immigration into the US. Then there are also non-immigrants who enter the job market much before their change of status to immigrant - when they are counted under immigration data. According to the US Immigration and Naturalisation Service (INS) figures, 1987, for example, the number of non-quota relatives actually exercising their right from

TABLE 4.6

IMMIGRANTS FROM INDIA TO THE UNITED STATES EXEMPTED FROM NUMERICAL LIMITATIONS (1989)

CATEGORY	NUMBER	PERCENTAGE
1. Immediate Relatives	8164	73.1
(i) Parents of adult US citizens.	4903	43.9
(ii) Spouses of US citizens.	2440	21.8
(iii) Children of US citizens.	822	7.4
2. Refugees & Asylee adjustments	27	0.2
3. Special Immigrants	188	1.7
4. IRCA legalization*	2658	23.8
5. Others	135	1.7
Total Immigrants (exempt from numerical limitation)	11173	100

* IRCA' refers to 1986 Immigration Reform and Control Act, which provided for legalisation of the status of some individuals who were in the United States illegally.

Source : US Immigration and Naturalisation Services (1989) Stastical yearbook, as given in Gardner(1992).

India was 7645 out of 8091 for all immigrants exempt from numerical limitations.[22] As such it was 95.5 percent of exempted number and 28 percent of total Indian immigration. In 1989, it was 26.2 percent of total immigration(Table 4.6). Table 4.6 seen with Table 4.2 shows that the total number exempted from numerical limitations was more than one third of total immigration from India in 1989.

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22. This information taken from Khadria, Binod; Migration of Human Capital to United States, 1990; Economic and Political Weekly, August 11, 1990, pg. 1789.

Like those entering through family preferences under numerical limitations, chances are fair that most of the non-quota immigrants are also highly qualified and hence important from the point of view of HQM migration. The choice for highly educated, generally professional, spouse by green card holders and naturalised the US citizens as evident by matrimonial advertisements in the Newspapers also suggest to this fact. It is also not very uncommon, though difficult to substantiate, for Indian immigrants in the US to leave their children back in India generally in boarding schools and hostels at college stage or with relatives upto a certain level of education. This has two obvious benefits (i) the advantage of high quality and low cost education, and (ii) sense of satisfaction that the parents derive from the feeling of growing up children in their home country. This second benefit has sociological implications as the education and stay in India generally develops strong family ties and other values which they would have perhaps failed to grow in the US society. These children join their parents at a later stage as immigrants either as non-quota relatives or on family preference visas, whatever the case may be. By all considerations, they are part of brain migration.

The US Immigration System is such, especially after 1965 amendments, that a person can enter as a non-immigrant i.e. a student temporary worker or trainee, exchange visitor or any other specified category and later get his or her status changed to an immigrant either under any of the preferences or under non-quota category. This provision has been used for permanent immigration by many temporary non-immigrants. A survey by National Science Foundation(NSF) of Scientists and Engineers emigrating to the United States in the first five years (1966-1970) of the new immigration system revealed that half of these had been in the USA on a temporary basis some time before they became immigrants, and that a majority of this group actually lived there when they become resident aliens.[23] Ten years later the NSF reported that the proportion of foreigners represented among those earning Ph.Ds in Engineering, the physical sciences, and Mathematics increased from the late 1960s. The labour department also reported that these

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23. National Science Foundation, Immigrant Scientists and Engineers, p vii, as given in Reimers, David M; Still the Golden door : The Third World Comes to America; Columbia University Press; New York, 1985, pg.99

students, once completing their education were more likely than previously to stay and work in the United States.[24] In 1978, over 18,000 non immigrant students became immigrants; of those about two thirds were Asians.[25]

Table 4.7 shows the data for Indians entering the US as non-immigrants for 1970-87 period. The total number admitted per year on an average has been continuously increasing every year. The human capital content is undoubtedly highest among students., temporary workers and trainees and exchange visitors and is certainly quite high among temporary visitors for both business and pleasure purposes. The spouses of students, temporary workers and trainees and exchange visitors are also generally highly educated. The percentage of non immigrants adjusting to immigrants has increased over the years. (Table 4.8). The percentage share of students changing their immigrant status has fallen down during the period and that of temporary workers and trainees and pleasure purposes have increased. This change of visa leading to permanent resident status comes only after certain years of stay in the USA when it is counted under immigration data. Obviously, it means the present system of immigration data as prepared and presented by Immigration and Naturalisation services of USA fails to reveal the real magnitude of immigration into the economy for any year. Hence the alternative way of counting immigration was suggested by some studies. One of them is as follows :In counting the brain drain related immigration, what ought to be done is that the long run average adjustment ratios of no immigrants (eg. one third students, half temporary workers and trainees) be used as a factor of discounting the yearly flaw through this (non immigrant) channel and the resulting number be added to the number of new arrival immigrants for the corresponding years. The bias due to accumulation of adjustment cases in a particular year and additional to that particular number to the number of new arrival immigrants that year may thus be avoided altogether. (Binod

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24. New York Times, July 5, 1981, as given in Reimers (op cit) 1985, pg.99

25. INS Statistical Yearbook, 1978, p.11, as given in Reimers (1985) op cit, pg.99.

Khadria, 1990, pg 179).

TABLE 4.7

INDIANS ADMITTED AS NON-IMMIGRANTS TO UNITED STATES BY STATUS OF ENTRY : (1970 - 1987)

STATUS AT ENTRY	1970-74	1975-79	1982-83	1984	1985	1986	1987
Foreign Govt Officials	3053	2716	1572	1096	1175	1522	1334
Temporary Visitors (Business)	23472	40925	29733	19933	21593	24213	25524
Temporary Visitors (Pleasure)	90387	180195	106326	63362	65612	72175	79167
Transit Aliens	21262	37135	7639	4123	3731	4066	4161
Treaty Traders & Investors	1041	635	81	25	30	27	35
Students	24126	14385	10595	6104	7754	9303	10828
Spouses & Children of Students	4645	2275	1266	648	546	708	816
Internatioanal Representatives	5230	7286	2837	2201	2257	2352	2181
Temporary workers & Trainees(TWT)	1337	1650	1629	966	1061	1380	2050
Spouses & Children of TWT	332	530	596	351	332	419	554
Exchange Visitors (EV)	9580	5943	3058	1764	2044	2210	2446
Spouses & Children of EV	4680	2724	1435	743	686	875	989
Returning Resident Aliens	55370	133164	-	-	-	-	-
All others	848	1846	4498	2467	-	-	-
Total Number Admitted	245363	431409	171265	103783	106821	119250	130085

Note : Data Not Available for 1980-81.
"-" Denotes not available.

Source : INS Annual Reports and Stastical Yearbooks (different years). For 1970-84 as given in Arnold Minocha and Fawcett(1987). For 1985-87 as given in Khadria (1990).

TABLE 4.8

INDIAN NON IMMIGRANTS IN UNITED STATES ADJUSTED TO IMMIGRANT (PERMANENT RESIDENT) STATUS - BY STATUS AT ENTRY (1970 -1987)

STATUS AT ENTRY	1970-74		1975-79		1982-84		1985-87	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
TEMPORARY VISITORS (BUSINESS)	282	1.1	365	1.8	286	2.5	465	3.3
TEMPORARY VISITORS (PLEASURE)	3301	12.4	4748	23.8	4159	36.4	5574	39.5
TREATY TRADERS & INVESTORS	88	0.3	46	0.2	32	0.3	31	0.2
STUDENTS	11142	41.8	8527	42.8	2502	21.9	3139 *	22.3 *
SPOUSES & CHILDREN OF STUDENTS	3193	12	2130	10.7	506	4.4		
TEMPORARY WORKERS & TRAINEES	337	1.3	300	1.5	1264	11.1	2930 **	20.8 **
EXCHANGE VISITORS(EV)	4285	16.1	1462	7.3	461	4	832 *	5.9 *
SPOUSES & CHILDREN OF EV	2777	10.4	1091	5.5	428	3.7		
PAROLEES AND REFUGEES	709	2.7	467	2.3	136	1.2	163	1.2
ALL OTHERS	511	1.9	774	3.9	1640	14.4	969	6.9
TOTAL ADJUSTED	26625	100	19910	100	11414	100	14103	100

* Includes Spouses and Children

** Only temporary workers for 1986-87 only.

Source : INS Annual Reports and Stastical Yearbooks (different years).
For period 1970-84, as given in Arnold, Minocha and Fawcett(1987) and for 1985-87 as given in Khadria (1990).

Apart from an adjustment on the above line, the immigration data also needs to incorporate cross tables relating to educational level along with various preferences. Only then, the immigration of HQM can be calculated more realistically. The above analysis, however, shows that HQM continued to migrate from India to the US in post 1965 period through various channels. The provisions of the immigration law and their continuation make it obvious that the law-makers were also fully aware of this kind of phenomenon occurring where human capital kept entering the economy originating from other countries, but this being not so visible in the existing form of statistics.

The above analysis, apart from showing that HQM kept entering the United States in various forms through different channels, also shows the limitations of public finance policy in reducing such migration. Any policy aimed towards the migration of professionals would have no applicability to those who migrate either through family preference category or through non-quota channels. Similarly, those who first migrate as non immigrants and later change their visa categories, cannot be brought under the purview of any such law. This means the continued migration of HQM during the period was unavoidable to the extent this could not be affected directly by any public finance intervention.

IMMIGRATION ACT OF 1990

After 1965 amendments, Immigration Act of 1990 is the most significant legislation relating to legal immigration into the USA. The primary focus of this act was on the numerical limits and preference system, though it also dealt with other aspects of immigration law - ranging from non-immigrants to criminal aliens to naturalisation. The bill increased the number of overall admissions to 700,000 during

fiscal year 1992, 1993 and 1994 and to 675,000 for 1995 onwards. As in the case of earlier quotas, this numerical limitation also did not include the immediate relatives of the US citizens, including parents, spouses and children. Besides according to this act, no country may receive more than 7 percent of all preference visas which resulted in an effective increase in per country level from 20,000 to approx. 25,000.

The most significant aspect of this act was its emphasis on employment based immigrants rather than on family reunification. The preference system was divided into two parts - (i) Family sponsored immigrants; and (ii) employment based immigrants.

(i) Family Sponsored Preference System : The following four preferences for family sponsored immigrants were retained in the 1990 act -

(1) Unmarried adult children of the US citizens - 23,400 visas plus any visa not used for class-4.

(2) Spouses and Unmarried sons and daughters of permanent resident aliens - 114,200 plus any visas not required for class 1.

(3) Married sons and daughters of the US citizens. - 23,400 visas plus any visas not used in class 2.

(4) Brothers and sisters of citizens - 65,000 visas plus any visas not required by 1 and 3.

Though the Act puts a limit of 226,000 annual admissions for family preference system, the cap is pierceable because of a special provision concerning second preference. This provides for additional visas under this category exceeding its own limit and total limit of 226,000. The act also makes a provision for 55,000 visas per year for three years starting from 1992 (the year of the enactment of this law) for immediate family members of those legalising under refugee amnesty programmes. Family admissions are

capped under the new law at 520,000 for 1992-94 and at 480,000 from 1985 as both non quota and family preference categories may exceed their limits..aw off

TABLE 4.9

FAMILY IMMIGRATION INTO UNITED STATES
UNDER PREVIOUS LAW AND THE IMMIGRATION ACT OF 1990

CATEGORY	Fiscal 1989 Levels	Immigration Act of 1990	
		Fiscal 1992-94	Fiscal 1995 and later
TOTAL IMMIGRATION	492347	700000	675000
Total Family Immigration	434606	520000	480000
Immediate Relatives of US citizens	Unlimited	Unlimited	Unlimited
(Spouses, children & parents of adults)	(217514)	(239000)	(254000)
Preference System	217092	226000 *	226000 *
1. Unmarried adult children of US citizens	13259	23400	23400
2. Immediate family of permanent residents	112771	114200 *	114200 *
3. Married children of US citizens	26975	23400	23400
4. Brothers & Sisters of US citizens	64087	65000	65000
IRCA Legalisation Relatives	—	55000	--

* Indicate that cap is "pierceable"

Source : Immigration and Naturalization Service, Stastical Yearbook 1989. As given in Fix and Passel (1991).

TABLE 4.10

INDEPENDENT IMMIGRATION INTO UNITED STATES
UNDER PREVIOUS LAW AND THE IMMIGRATION ACT OF 1990

CATEGORY	Fiscal 1989 Levels	Immigration Act of 1990	
		Fiscal 1992-94	Fiscal 1995 and later
TOTAL IMMIGRATION	492347	700000	675000
Total Independent Immigration	57741	180000	195000
Employment Based Immigration	57741	140000	140000
(Workers)*	(24250)	(58800)	(58800)
Priority Workers**	26798	40000	40000
Professionals with advanced degrees***	(included above)	40000	40000
Skilled workers & Professionals	25957		
Unskilled workers (included above)		(10000)	(10000 limit)
Special immigrants #	4986	10000	10000
Investors of $1 million who employ 10 or more people	—	10000	10000
Diversity Immigrants	—	40000	55000
Irish (already in the US)	—	16000	—

* Shows the number of workers in the category; others are family members of workers.
** Workers of extraordinary ability, professors and researchers, executives and managers.
*** Professionals whose services are sought by a particular employer.
# Includes ministers and employees of international organisations.

Source : Immigration and Naturalisation Service, Stastical Yearbook 1989. As given in Fix and Passel (1991).

A comparison of these preference categories with that of 1965 in Table 4.9 shows that the upper limits for first and third (fourth in 1965 preference system) categories were reduced form 54,000 and 27,000 to 23,400 for each one. However, the limit for the second category has been increased significantly from 70,200 to 114,200 and for the fourth (fifth in 1965 act) has been almost retained at same level of 65,000. This fourth category has been an important vehicle for Asian immigration and its retainment can be seen as a positive altitude towards them.

(ii) Employment based preference System : Under employment based immigrants, the act has specified five categories which are as follows :

(1) Priority Workers: 40,000 visas plus any visas not required for class 4 and 5 under the same preference. Priority workers included :

(a) Aliens with extra ordinary ability.
(b) Outstanding Professors and Researchers.
(c) Certain multinational executives and managers.

(2) Members of the Professions holding advanced degree or aliens of exceptional ability : 40,000 visas plus any visas not required for class (i).

(3) Skilled Workers : 40,000 visas plus any visas not required for (i) and (ii).

(4) Certain Special Immigrants : 10,000 visas for other workers than those specified in earlier categories.

(5) Employment Creation : 10,000 visas for immigrants who seek to enter for the purpose of engaging in a new enterprise employing not lower than 10 the US citizens and amount of capital invested should not be less than $1 million except in case of targeted areas where the minimum limit is $500,000.

The new law increased the number of employment based visas significantly from 58,000 per year to 140,000. However, this number also includes the families of the workers and workers constitute around 40 percent of the total. But as seen earlier, a good number of family members are also highly educated and join the work force in the US. This act has also changed the skill mix of employment based immigrants significantly. Table 4.10 shows that the bill reflects a strong bias towards professionals and skilled workers as

opposed to unskilled workers. Visas for the unskilled category declined by almost half and were capped at 10,000 in the new law.

The significant increase in the overall limit of employment based visas as well as the strong emphasis on qualification and skill is going to have serious impact on immigration of Indians. The demand for immigrant visas by Indians has always been grater than the limitation set by the law and hence the increased quotas are certainly going to be used. The shift of emphasis leading to increased number of professionals and highly educated immigrants is certainly going to attract more Indian HQM. The Act of 1990, in fact, seems to be guided mainly by economic imperative of forging a link between immigration and human resource policy. The following remark made in the context of 1990 immigration act makes it obvious:

> Proponents of immigration reform says that immigration could provide a means for responding more effectively to two types of mismatches that were perceived to be on the demographic horizon. The first was the coming mismatch between number of jobs to be filled and the number of workers available to fill them. The second coming crisis was a mismatch between the limited skill of these workers and the technical demands of the jobs they would be called on to fill. This scenario was the vision of the future advanced by a report by the Hudson Institute in Work Force 2000: Work and Workers for the 21st Century,[26] a report that was widely and approvingly cited during debates over the proposed law. (Fix and Passel, 1991, pg.10).

The provision of 10,000 visas for foreign investors also serves the purpose of benefiting the economy primarily through employment creation. The law requires that the commercial enterprise established by the foreign investor create full employment for atleast 10 US citizens or immigrants, not in-

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26. Johnson, W.B. and A.E. Packer, Work Force 2000 : Work and Workers in the 21st Century; The Hudson Institute, Indianapolis, Indiana, 1987.

cluding the investors spouses or and children. This provision may be used widely by non immigrants seeking to change their status to immigrants as there is no requirement that the qualifying capital must come from outside the United States.

Diversity Immigrants : The Third part of the preference system dealt with diversity immigrants. The idea behind this was the promotion of cultural pluralism through diversification of the immigrants system. During the first three years following the law's enactment (1992-94), national origin and not human capital considerations would largely determine who gets an immigrant visa. However, beginning in 1995, applicants for diversity visas must have a high school education or two years training or experience. National origin will, however, remain important as the 55,000 diversity visas would be made available, using a complicated formula, to countries that have sent comparatively fewer immigrants. According to the specifications, Indians are also qualified for this category of visa.

On the whole, the immigration act of 1990 has made the immigration of HQM easier and as such the United States preference for highly qualified has become more explicit and obvious. This is evident not only in increased number of employment based visas but also by an emphasis on human capital content for almost all kinds of visas. Because of the large backlogs and established networks, a continuation of the large number of immigrants from Asia is expected under the revision of the 1990 Act. The rate of immigration from India, in fact, may increase as a consequence of all new provisions of act, which very much suit them.

The above account and analysis suggest that the immigration policy of the US has always been guided by the labour market considerations of the relevent period. For the last forty years the policy has been welcoming towards immigrating HQM, though not always very explicitly so. The increased emphasis

on family reunification rather than on human capital in 1965 policy satisfied the sociological and political need of the period when an immigrant coming under the employment preference was seen as a competitor while that admitted under family preference was more accepted on humanitarian ground. That good number of HQM kept migrating even under family preferences has already been discussed at length. However, in the 1980s, attitude and perception changed and more and more sociologists, demographer and economists were demanding for a change in immigration policy to suit American economy.[27] A good percentage of this influential section of policy makers were of the view that the best potential immigrants are those who work hard and bring useful human and capital resources to enrich the country socially and economically. These views were amply reflected in 1990 policy, which emphasised both on human capital and financial investments as criterion for immigrant status. On the whole, the American Immigration Policy has been welcoming towards HQM and will probably remain so for at least next few decades. However, to examine the macro economic factors working on the demand side for HQM, one also needs to analyse the labour market situations of the US economy along with an analysis of immigration policy.

4.2 LABOUR MARKET SITUATIONS IN THE USA :

To analyse the labour market situation in the United States in order to see the trends in demand for HQM in the context of immigration of Indians, two types of evidences have been used here - (i) trends

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27. See, for example, Briggs, V.M.; Employment Trends and Contemporary Immigration policy in Nathan Glazer (ed); Clamour at the Gates; ICS Press, California, 1985, Cafferty, Chiswick, Greelay and Sallivan; The Dilemma of American Immigration - Beyond the Golden door, New Jersey, USA, 1983; and Johnson W.B. and A.E.Packer; op cit.

in occupational employment; and, (ii) the scenario relating to job related education and training in the USA, The regular data available on labour market situation is usually sector wise which is of little relevance here. The occupation related data are more relevant for our purpose and hence available evidences in that area have been analysed here.

4.2.1 TRENDS IN OCCUPATIONAL EMPLOYMENT :

The second half of the 20th century saw large scale growth in white collar work force with the expansion of the economy. the increasing size and number of commercial organisations and growth in demand for services spurred demand for white collar workers, while the relatively slow growth of manufacturing and construction activities depressed the demand for operatives, non farm labourers and craft workers. The percentage share of total white collar work force including professional speciality, managerial and administrative executives, marketing and sales personnel, administrative and technical support rose from mere 43.1 percent in 1960 to as high as 56.4 percent in 1992(Table 4.11). On the other hand, the share of blue collar jobs declined from 36.3 percent in 1960 to 24.7 percent in 1992. The percentage share of service occupations has increased from 12.7 percent in 1960 to 16 percent in 1992 and that of agriculture and allied work force has declined from 7.9 percent in 1960 to 2.9 percent in 1992. The same trends are projected to continue for another decade further increasing the share of white collar and service occupations and declining of blue collar and agricultural jobs.

The trends in real size of employment for different occupations is also very important as it bears an important effect on structure of total employment. It is quite possible that a significant number of jobs are added by the slower growing occupations mainly because of this large employment base. But, this does not seem to be very true about blue collar jobs. (Category 7 and 8 in Table 4.12), that

TABLE 4.11

PERCENTAGE DISTRIBUTION OF EMPLOYMENT, BY MAJOR OCCUPATIONAL GROUPS IN UNITED STATES
(SELECTED YEARS)
(ACTUALS FOR 1960-1992 AND PROJECTED FOR 2005)

OCCUPATIONAL GROUP	1960 *	1970 *	1972 *	1974 *	1980	1986	1988	1990	1992	2005
1. Executive, administrative and managerial	11.2	7.9	9.8	10.4	10.9	9.5	10.2	10.2	10	10.3
2. Professional Speciality	11 #	14 #	14 #	14.4 #	11.3	12.1	12.4	12.9	13.7	15.5
3. Technicians and related support	--	--	--	--	3	3.3	3.3	3.3	3.5	3.8
4. Marketing and Sales	6.4	6.8	6.6	6.3	8.7	11.3	11.3	11.5	10.7	10.6
5. Administrative Support occupations incl. clerical	14.5	16.9	17.4	17.5	16.9	17.8	17.8	17.9	18.5	17.2
6. Service Occupations	12.7	11.8	13.4	13.2	15.2 @	15.7	15.6	15.7 @	16	17.5
7. Precision production, craft, repair workers	13.3	12.9	13.2	13.4	30.4	12.5	12	25.6	11.2	10.4
8. Operators, fabricators and labourers	23	20.5	21.8	21.3	--	14.6	14.4	--	13.5	12.1
9. Forestry, fishing, Agriculture and related occupation	7.9	5.8	3.8	3.5	3.4	3.2	3	2.9	2.9	2.5
TOTAL ^*	100	96.6	100	100	99.8	100	100	100	100	99.9

* The data for the period 1960-74 followed a different distribution of occupation and hence, not strictly comparable to the later period which follows this distribution. For example, there was no category of professional speciality and the data given here is for the professional and technical workers. The following chart gives the categories for 1960-74 which were taken for the present distribution.

(Contd.....)

Present		1960-74
(i) Executive, administrative and managerial	-	Managers and Administrators
(ii) Professional Speciality	-	Professional and Technical Workers
(iii) Marketing and Sales	-	Sales
(iv) Administrative Support	-	Clerical Workers
(v) Service Occupations including clerical workers	-	Service Workers
(vi) Precision production, craft & repair workers	-	Craft and Kindered Workers
(vii) Operator, fabricators & labourers	-	Operators and Non-farm labourers
(viii) Agricultural, forestry, fishing and related occupation	-	Farm Workers

This can be taken broadly as inclusive of category 3. See note '*' for explanation.

@ includes category 8.

^* Total do not always add to hundred due to rounding off of figures.

Source : Bureau of Census, United States, as given in Monthly Labour Review various issues.

have almost stagnated during 1980s. However, they are projected to increase in number in future. On the other hand, for almost all categories of white collar jobs (category 1 to 5 in table 4.12), and service occupation the numerical increase is also very significant over the years. The employment in agriculture and allied occupations has stagnated during 1970s and 1980s.

TABLE 4.12

DISTRIBUTION OF EMPLOYMENT, BY MAJOR OCCUPATIONS IN UNITED STATES
(SELECTED YEARS)

(ACTUALS FOR 1960-1992 AND PROJECTED FOR 2005)

(in Thousands)

OCCUPATIONAL GROUP	1960 *	1972 *	1974 *	1980	1986	1988	1990	1992	2005
1. Executive, administrative and managerial	7367	8032	8941	11136	10583	12104	12451	12066	15195
2. Professional Speciality	7236	11459	12338	11502	12538	14628	15800	16592	22801
3. Technicians and related support	-	-	-	3079	3726	3867	4204	4282	5664
4. Marketing and Sales	4210	5354	5417	9023	12606	13316	14088	12993	15664
5. Administrative Support occupations including clerical	9538	14247	15043	17264	19851	21066	21951	22349	25406
6. Service Occupations	8354	10966	11477	15547 #	17536	18479	19204 #	19358	25820
7. Precision production, craft, repair workers	8748	10810	18299	31032	13924	14159	31369	13580	15380
8. Operators, fabricators and labourers	15129	17766	11373		16300	16983		16549	17902
9. Forestry, fishing agriculture and related occupation	5196	3069	3048	3524	3556	3503	3506	3530	3650
TOTAL	65778	81703	85936	102107	110620	118105	122573	121299	147482

* The data for the period 1960-74 follow4ed a different distribution of occupation and hence, not strictly comparable to the later period which follows this distribution. For example, there was no category of professional speciality and the data given here is for the professional and technical workers. The following chart gives the categories for 1960-74 which were taken for the present distribution.

Present		1960-74
(i) Executive, administrative and managerial	-	Managers and Administrators
(ii) Professional Speciality	-	Professional and Technical Workers
(iii) Marketing and Sales	-	Sales
(iv) Administrative Support	-	Clerical Workers
(v) Service Occupations including clerical workers	-	Service Workers
(vi) Precision production, craft & repair workers	-	Craft and Kindered Workers
(vii) Operator, fabricators & labourers	-	Operators and Non-farm labourers
(viii) Agricultural, forestry, fishing and related occupation	-	Farm Workers

This can be taken broadly as inclusive of category 3.
See note above for explanation.

Source : Bureau of Census, United States, as given in Monthly Labour Review various issues.

The fastest growing occupational group during the 1960s was professional, technical and kindred workers, which expanded by 55 percent, nearly 3 times the rate of increase in total employment. Professional speciality occupation kept increasing at a very fast rate during next two decades, i.e., 1970s and 1980s. This is important from the point of view of HQM immigration into the USA and it shows that the labour market had enough openings for them. The emigrating IIT professionals fit into this category very well. Besides, other rapidly growing occupational groups like managers also suited Indian HQM well. In future also, such openings are going to be present as professional speciality is the fastest growing sector for next decade as projections show(Table 4.11).

TABLE 4.13

OCCUPATION OF EMPLOYED NATIVE BORN, AND OF FOREIGN BORN BY SELECTED YEARS OF ENTRY INTO THE UNITED STATES AND CITIZENSHIP STATUS, APRIL, 1983 (In Percent) #

OCCUPATIONAL GROUP	Total##	Native Born*	Foreign born entered US prior to 1992				
			Total**	Year of Entry			
				Before 1960	1960-79	1980-81	US Citizen
1. Executive, administrative and managerial	11.1	11.2	9.7	14.1	8.6	5.9	12.5
2. Professional Speciality	13.2	13.1	14.1	15.6	13.7	13.5	17.4
3. Technicians and related support	2.9	2.9	3.4	3.4	3.3	4.2	3.4
4. Sales Occupations	11.5	11.7	8.8	9.3	8.7	8.2	9.5
5. Administrative Support including clerical	16.4	16.6	12.7	13.4	12.7	9.8	13.3
6. Private Household	1	1	1.4	1.2	1.2	3.3	1
7. Protective Service	1.6	1.6	0.9	1	0.9	0.7	1.2
8. Service except (6) & (7)	11	10.8	14.2	11	15	18.2	12.9
9. Precision Production, craft and repair	12	12	12.7	15.4	12.2	10.2	12.7
10. Operators, fabricators & labourers	15.7	15.6	18.1	12.9	19.3	21.3	14
11. Farming, forestry and fishing	3.6	3.5	4	2.7	4.3	4.7	2
TOTAL	100	100	100	100	99.9	100	99.9	0

Foreign born, as identified by Current Population Survey, were persons whose "usual residence" was in the United States, such as immigrants and refugees. Foreign born visitors are not included.

Total includes respondents who did not report country of birth or citizenship states, as well as foreign born respondents who entered the United States in 1982 or 1983.

* Includes respondents who were born abroad of parents who were US citizens.

** Includes respondents who did not report any year of entry. Excludes respondents who did not report country of birth or citizenship status.

Source : Current population survey, Bureau of Labour Statistics, United States, (1984) as given in Sehgal, Ellen (1985).

Table 4.13 shows the occupation of employed native born and of foreign born by selected years of entry into the United States and citizenship status in April 1983 revealing certain interesting features. For native born Americans percentage distribution of occupation among employed was almost the same as the total persons employed. Foreign born Americans, however, had larger than average share in certain occupations like professional speciality, technical support, service occupations and for certain blue collar jobs. Obviously, for the rest of the occupational groups, foreign born Americans reported less than average share. However, for foreign born workers, the period of stay in the US seems to have significant impact on the choice of occupation. For example, percentage share of professional speciality, managerial and administrative executives and precision production, craft and repair kept increasing with increase in periods of stay. For service occupations, operators, fabricators, labour and household jobs, new entered foreign workers had a high a share which fell with longer stays. This, thus, means the newly arrived foreign workers become upwardly mobile in some, say 4 to 6 years of time and move to better paid occupations. The percentage share of professional speciality is very high for foreign born US citizens, probably because citizenship status makes them more acceptable, especially for higher posts.

4.2.2 JOB RELATED EDUCATION AND TRAINING :

The educational attainment of the US labour force has been increasing during 1970s and 1980s (Table 4.14). The percentage share of those with 4 or more years of college education has increased from 14.1 percent in 1970 to 26.8 percent in 1991 whereas that of 1-3 years of college education has increased from 11.8 percent to 21.3 percent during the same period. On the other hand, the percentage share of work force having fewer than 4 years of high schooling has shown a decline from 36.1 percent in 1970 to 12.8 percent in 1991 and that of those having 4 years of high school has remained about the same during the period. The similar trend can be observed for enrollment in colleges (Table 4.14).

TABLE 4.14

PERCENT DISTRIBUTION OF THE LABOUR FORCE IN UNITED STATES (25 TO 64 YEARS OF AGE) BY EDUCATIONAL ATTAINMENT, (SELECTED YEARS : 1970-1991)

YEAR	Fewer than 4 years of high school	4 years of high school	1-3 years of college	4 or more years of college
1970	36.1	38.1	11.8	14.1
1975	27.5	39.7	14.4	18.3
1980	20.6	39.8	17.6	22
1985	15.9	40.2	19	24.9
1990	13.2	39.4	20.9	26.5
1991	12.8	39.1	21.3	26.8

Source : Current Population Survey (1992). As given in Eck, Alan (1993).

TABLE 4.15

SELECTED INFORMATION ON EMPLOYMENT, EDUCATION, TRAINING AND EARNING FOR FULL TIME WORKERS, BY MAJOR OCCUPATION GROUPS IN UNITED STATES, 1983 AND 1991.

Occupation group	Employment# 1991 No. of total Employment (in '000)	Percent Change 1981-83	Share 1991	Percent change in share 1983-91	Percent high school graduates or less 1983	1991	Percent college graduates* 1983	1991	Percent using training* 1983	1991	1991 weekly earning's (1983 dollars)#	Percent change in real earnings #1983-91
Total	83525	17.7	100	0	57.2	52.2	24.1	26.4	70.3	70.9	316	0.9
Managerial & professional speciality occupations	23109	32.4	25.6	12.5	20.5	19.3	62.2	61.4	91.8	90.6	460	5.3
Technical, sales and administrative support occupations	25141	16.2	19.5	-1.3	55.9	50.5	17.7	20.9	71.9	71.8	289	2.9
Service occupations	8908	21.7	9.4	3.4	75.7	73	6.9	7.1	53.5	51.7	206	0.3
Precision production, craft & repair occupations	10642	6.8	20.4	-9.2	77	72.5	5.6	6.4	76.4	74.4	355	-5.9
Operators, fabricators & labourers	14129	6.1	22.5	-9.9	86.8	82.7	2.9	3.8	46	45	258	-6.3
Farming, forestry & fishing occupations	1397	9.1	2.6	-7.3	78.2	75.6	9.2	9.1	29.1	34.9	193	-1.5

1983 and 1991 Current population Survey annual averages.
* January 1983 and January 1991 Current Population Survey data.

Source : Current Population Survey (1992). As given in Eck Alan (1993).

Table 4.15 presents information about employment, educational attainment, and earnings for full time workers for 1983 and 1991. As shown earlier, managerial and professional speciality occupations experienced the highest growth rate and greatest increase in employment share between the two years. This group had the lowest proportion of full time workers with an education of high school or less and the highest proportion of college graduates as well as trained workers. All those occupations which had longer shares of less educated work force showed a decline during the period, except service occupations. Both the average earnings and rate of growth in earnings were highest for managerial and professional speciality group.

Despite high growth rate of occupations needing high educational skills and higher earnings attached to such jobs as well as increase in education level of the US workers, there exists a gap between the job openings and the number of completions of educations and training programme. This can be seen in one such comparison carried out by Bureau of Labour Statistics Occupational Outlook Programme of the United States. This exercise showed that overall, there are nearly 2.9 million awards and degrees in 1989-90, compared with an estimated 4.4. million job openings, on an average, for new entrants to the work force each year from 1990-2005. This meant, the number of individuals completing training programme in 1989-90 was about 65 percent of the average annual number of job openings anticipated through 1990s.[28] Some of these jobs must not be requiring post secondary school training, and hence cannot be taken as forming the gap; a part is certainly indicative of the requirements of education and trained personnel. However, this can be taken only as indicative suggestion and not definitive information primarily because

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28. This information was taken from Eck, Alan; Job Related Education and Training : Their Impact on Earnings; Monthly Labour Review, October, 1993.

of several limitations[29] of such comparisons.

The above suggestions, however, gets affirmed in the certain policy documents of the period. For example, the following statements reveal the official concern for the state of education in the US:

> The quality of the US Work force matters now more than ever. Well-trained, motivated workers who can produce high quality goods and services at low cost help enhance industrial productivity and keep American living standards high.... Training goes hand in hand with productivity, quality, flexibility and automation in the best performing firms (Worker Training : Competing in the New International Economy; Report No.OTA-ITE-457 (Office of Technology Assessment, September 1990, pg.3)[30]

Similar concern can be seen in another policy statement -

> What is required are more Americans who can understand mathematical and scientific principles and can apply them to everyday problems on the factory floor and in the executive suite. What is required or for more Americans who can read and understand complex technical material - and use that knowledge to perform new tasks. (Report of the Task Force on Education, Educating America, State Strategies for Achieving the National Education Goals (Washington, National Governor's Association, 1990, pg.7))[31]

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29. The limitations of such comparisons were identified by Alan Eck; ibid; as folows :

(i) Chance of error due to subjective decisions relating to matches between occupations and fields of study;
(ii) accuracy of comparison depends on the accuracy of projections relating to employed growth in occupations;
(iii) includes only school and college degrees. Does not include training obtained in apprecenticeship programmes;
(iv) certain fields of study left because of no matching occupation; and
(v) certain occupation not included due to no matching fields of study.

30. As given in ibid, page 21.

31. As given in ibid, page 21.

It is clear from the above analysis that for about past thirty years, labour market situations have been highly favourable to migrating Indian HQM and immigration policy has been in tune with it, admitting them in large numbers. Occupational growth projections and existing educational scenerio show that the gap between required high level skills and employment positions will continue in future. The new immigration act of 1990 has given full considerations to these gaps in labour market, as evident from its emphasis on education and training. Hence it can be concluded here that the high demand for Indian HQM is going to continue in the U.S., the main receiving country, in foreseeable future.

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CHAPTER V

INDIANS IN THE US ECONOMY AND CASES OF EMIGRATING IIT GRADUATES

The scenario relating to occupation related education and training seen with the evidences on occupational changes and growth as well as characteristics of immigration policy as discussed in the previous chapter suggested a rising demand for HQM in the US. To see how Indian immigrants fit into this situation, certain characteristics of Indians in the US economy are being considered in this chapter. This has been done mainly with the help of evidences available from the official soureces on the U.S. economy. Following this, the experiences of emigrating IIT graduates regarding immigration, jobs, profession, income and treatment have analysed to have deeper insight into this question as well as to identify the existing links between emigrated professionals and Indian economy, several cases have been prepared based on the information provided by IIT graduates.

5.1 INDIANS IN THE U.S. ECONOMY :

India ranks fourth, according to the 1980 census, in terms of population among Asians after Chinese, Filipino and Japanese. The rate of immigration, however, is higher for India for 1980s and it follows Philippines and Korea leaving China and Japan behind.

Indians seems to be very well accepted in the US Economy. Labour force participation rate of Indians was 74.7 percent in 1980 - higher than any other immigrant group. The total average US labour force participation rate was 62 percent whereas that for all immigrants was only 55.8 percent (Table 5.1). The rate of employment for those in labour force for Indians was 94.6 percent - same as total Asian immigrants. Though this rate was higher than the US average or average for all immigrants, this rates for immigrants from North America and from Philippines were higher than Indian rate..AW OFF

TABLE 5.1

LABOUR FORCE PARTICIPATION OF IMMIGRANTS IN UNITED STATES AGED 16 AND OVER (1980)

Region & Country of Birth	Percent in labour force	Percent of those in Labour Force currently employed
Total US	62	93.5
All Immigrants	55.8	93.3
Europe	47.4	94.5
USSR	34.8	92.6
Africa	60.8	93.1
North America	50.3	95.2
Latin America	66	91.5
Mexico	64.2	90.2
Asia	62.6	94.6
India	74.7	94.6
Korea	63.8	94.2
Philippines	72.6	95.6

Source : Bureau of the Census, 1980, Census of population, pc 80-ICI, Table 86, and unpublished tabulations of the foreign born by place of birth. As given in Bouvier and Gardner (1986).

TABLE 5.2

OCCUPATION OF EMPLOYED IMMIGRANTS IN UNITED STATES AGED 16 AND OVER : 1980

Region & Country of Birth	Managers Professionals & Executives	Sales & Administrative support	Services	Operators, fabricators & labourers
Total US	22.7	27.3	12.9	18.3
All Immigrants	21.2	21.5	16.1	22.1
Europe	23.9	22.8	14.8	18.4
USSR	27.8	22.8	12.2	17
Africa	36.1	23.5	14.2	12.9
North America	29.6	29.6	11.4	12.3
Latin America	11.2	17.9	18	31.3
Mexico	5.4	10.2	16.6	39.3
Asia	31.1	22.1	16.2	15.3
India	55.3	17.4	5.3	8
Korea	24.5	23.1	17	21.2
Philippines	28.1	26	16.2	13.2

Source : Bureau of the Census, United States 1980.
As given in Bouvier and Gardner (1986).

Occupational profile of Indians in the US is very impressive. According to one study of 345 Indian residents in New York Metropolitan area, 73 percent of the men in the labour force could be clas-

sified as technical or professional worker in 1980. Even among Asian Indian women in this sample, the profile was similar with nearly half - 47 percent falling in this category of professional and technical worker - considered to be the most prestigious group in the US[32] Though this conclusion cannot be generalised easily, since New York had the single largest concentration of Indians (17.5 percent of total population in 1980), this is certainly not unrepresentative of the whole, as evidenced by figure given by National occupational data. According to 1980 census, more than half - 55.3 percent - of Indian workers were in the occupation category of "Managers, Professionals and Executives, as against the average figure of 60 percent derived from New York sample (Table 5.2). This percentage (55.3) is more than twice the rate for all Americans (22.7 percent) and significantly higher than any other immigrant group.

The Indians in US have a very high average income considering the general average there. In 1979, median annual income for both males and females were highest for Indians among all immigrant groups. This was true for both full time workers taken separately or for all workers taken together (Table 5.3(A)). Table 5.3(B) shows that ten year later durin 1989-91 also, Asian Americans had a edge over other groups in thier income.[33] The Asian Americans received higher salaries compared to other groups including white Americans.

32.Saran, Parmatma, The Asian Experience in the United States : Schenkman, Massachusettes, 1983.

33. Data were not available for all the immigrant groups for this period (1989-91) and hence the average income for Indians can be taken as more than that for Asian Americans.

TABLE 5.3(A)

MEDIAN INCOME OF IMMIGRATION WORKERS IN UNITED STATES: 1979
(WORKERS AGED 15 AND OVER)

(IN US$)

Region & Country of Birth	MALE		FEMALE	
	Median Income of all workers	Median Income of full time workers	Median Income of all workers	Median Income of full time workers
Total US	12192	17363	5263	10380
All Immigrants	10342	-	5094	
Europe	12344	-	4850	
USSR	9465	20098	4344	12034
Africa	11003	18014	5760	11093
North America	13539	21091	5218	12062
Latin America	9019	12255	5184	8681
Mexico	8192	10809	4442	7408
Asia	11412	17557	6328	11384
India	18421	22649	7162	13138
Korea	12111	17607	6011	10092
Philippines	11190	15240	8713	12715

Source : Bureau of the Census, United States 1980.
As given in Bouvier and Gardner (1986).

TABLE 5.3(B)

PER CAPITA ANNUAL MONEY INCOME IN CURRENT DOLLARS
BY RACE AND ORIGIN AND PER CAPITA MEDIAN ANNUAL SALARY
BY EDUCATIONAL DEGREES IN THE UNITED STATES

RACE/ ORIGIN	PER CAPITA INCOME (1991)	PER CAPITA MEDIAN ANNUAL SALARY	
		Bachelors (1990)	Doctorate (Ph.Ds) (1989)
ALL UNITED STATES	14617	N.A.	N.A.
WHITE	15510	26100	54800
BLACK	9170	24000	48500
HISPANIC	8662	25100	50000
ASIAN AMERICANS	N.A.	30000	55000

N.A. : Not Available

Source : US Bureau of the Census, Current population Reports, as given in the Statistical Abstract of the US,1993 and National Science Foundation, United States, 1992.

High rate of income, high ranking occupations and labour force participation, in fact, suggest high level of education and training of Indians in the US. This fact is also corroborated by the available evidences regarding education levels of Indians in the U.S.(Table 5.4 and 5.5). The 1980 US census shows that 88.9 percent of Indian population in US had completed high school and 66.2 percent were college graduates. Both these percentages were significantly higher than that of other immigrant groups or total US average, the difference being much larger for college graduates. The percentage of population having

high school degree among Indians was also slightly higher than that for whites as a whole.

TABLE 5.4

EDUCATIONAL ATTAINMENT OF TOTAL U.S. POPULATION AND IMMIGRANTS AGED 25 AND OVER : 1980

(Numbers n percen

Region & Country of Birth	No High School*	Completed High School	Completed College
Total US	18.3	66.5	16.2
All Immigrants	35.6	53.1	15.8
Europe	37.8	51.2	12.1
USSR	37.9	50.2	17.1
Africa	11.6	81.9	38.7
North America	20.4	61.8	14.3
Latin America	47.6	41	8.9
Mexico	68.4	21.3	3
Asia	18.9	73	35.9
India	5.6	88.9	66.2
Korea	14	77.8	34.2
Philippines	18.3	74	41.8

* No more than eight years of education

Source : Bureau of the Census, United States 1980.
As given in Bouvier and Gardner (1986).

TABLE 5.5

EDUCATIONAL ATTAINMENT OF DIFFERENT ETHNIC GROUPS IN UNITED STATES AGED 25 TO 29 : 1980

(Numbers in percent)

Ethnic Groups	High School Graduates	
	Male	Female
Asian Indians	93	87.9
Whites	87	87.2
Blacks	73.8	76.4
Hispanics	58.4	52.9

Source : 1980 Census of Population. As given in Kitano and Daniels (1988).

At the other end of the economic system, Indian families were very unlikely to receive public assistance, only 4.5 percent of these families received assistance in 1980. Only Indians among the Asian immigrant groups had a figure(4.5%) below that for whites which was 5.9 percent. Public assistance was received by 6.2 percent of Korean families, 6.6 percent of Chinese families, 10 percent of Filipino families and 28.1 percent of Vietnamese families. This figure was 15.9 percent for Hispanics and 22.3 percent for blacks(Table 5.6).

TABLE 5.6

RELIANCE ON PUBLIC ASSISTANCE BY ETHNICITY IN UNITED STATES(1980)

ETHNICITY	Percentage of Households with aggregate income from public assistance
White	5.9
Black	22.3
Hispanic	15.9
Japanese	4.2
Chinese	6.6
Filipino	10
Korean	6.2
Indian	4.5
Vietnamese	28.1

Source : US Bureau of the Census, as given in Xenos, Gardner, Barringer and Levin (1987).

The above account show the high position of Indians in the US economy. The Indians have certain other characteristics also which we see desirable and enhances their acceptability in the US economy. The Indians have remarkably stable families considering the high rate of broken and separated families in the US. The Indian women have also demonstrated significantly lower fertility rate.[34] The children of Indian

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34. See ibid, pg.100 for detailed information on Stability of family and fertility rate. Also see Xenos, Gardner, Barringer and Levin (1987), pp 263-266.

families are doing well in education and receiving various prestigious awards especially in the field of science.

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The success of Indians in particular and Asians in general attracted wide spread publicity. They have generally been looked at positively contributing to American economy and generating desirable social values.

5.2 EVIDENCES FROM SURVEY OF MIGRATING IIT GRADUATES :

93 out of 110 (84%) respondents in the survey of migrating IIT graduates had gone to USA. Certain information provided by them are relevant in the present context.

5.2.1 **IMMIGRATION STATUS :** Most of the IIT Students (93 percent) went to US on a student visa and spent several years as student doing either masters or doctoral work. The rest 7 percent were equally divided among exchange visitors visa, temporary workers and trainees and immigrant visa(Table 5.7). Both the persons migrating to the US with immigrant status were women and got the visa on family preference. All those who had entered the US as non-immigrants had either changed their status to that of permanent resident or had applied for it, depending on the period of stay. Generally speaking, most of them took five to ten years to change their status that of immigrant. Almost all of them expressed the feelings that it was not difficult to get immigrant visa because of their being highly educated professionals, though the process has become slightly cumbersome lately. The average period for waiting since the time

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35. For example, see 'Get Ready for the New Work Force' by Joel Dreyfuss in Fortune, April 23, 1990, Vol.121, No.9, Louis Winnick, "America's model minority"; Commentary Vol.90, No.2, August 1990, pp. 22-29, cover story of Business Week July 13, 1992 entitled - "The Immigrants - how they are helping to revitalise the US economy and The Wall Street Journal January 27, 1987.

of application for and granting of such status was less - around one year - in 1970s compared one and half or more for 1980s.

TABLE 5.7

IMMIGRATION STATUS OF MIGRATING IIT GRADUATES AT THE TIME OF ENTRY INTO THE UNITED STATES

IMMIGRATION STATUS	NUMBER OF IIT GRADUATES	%
1. Immigrant (Permanent Resident Status)	2	2.4
2. Temporary Workers and trainees	2	2.4
3. Exchange visitors	2	2.4
4. Students	78	92.8
Total	84	100

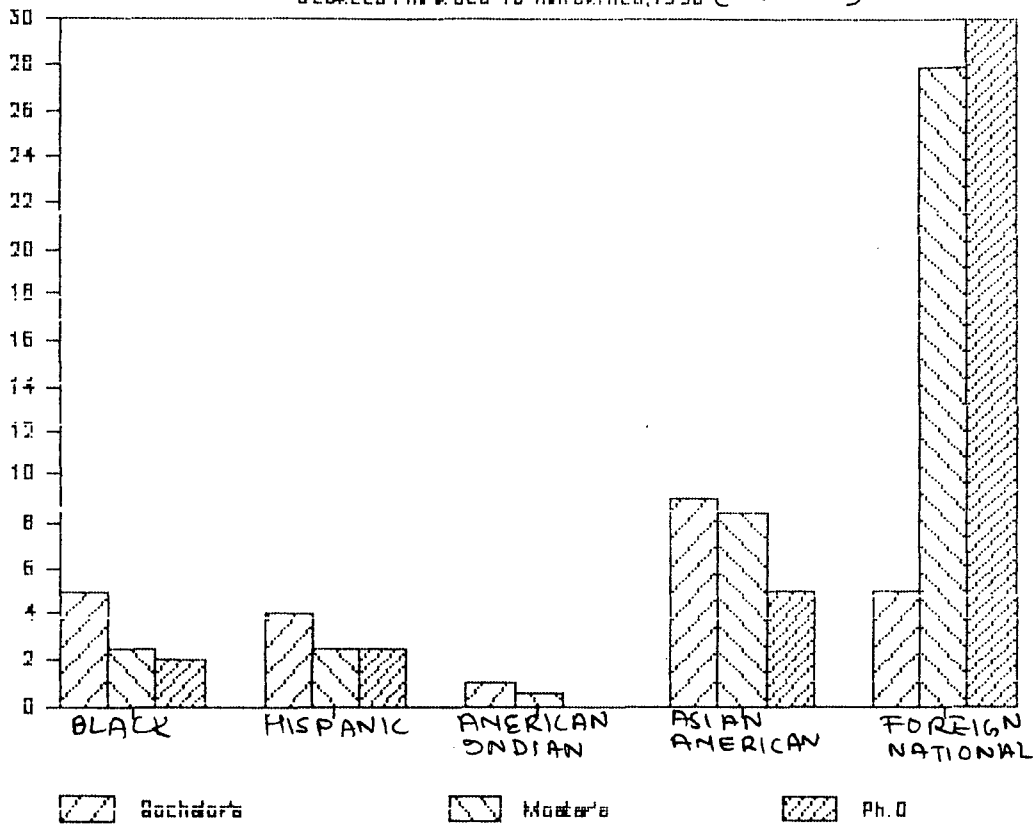
5.2.2 EMPLOYMENT, INCOME AND TREATMENT IN THE USA :

Since all the respondents were highly educated in the field of science and engineering, they naturally belonged to the occupational group of professional speciality and managerial executives. Interestingly, 60 percent of respondents were either in Academics, working in universities or in Research & Development, working in laboratories. The next 33.4 percent were executives with either private industry or financial institutions, usually holding managerial posts. A small percentage (6) has also taken to own business and consultancy firms (Table 5.8). Almost all those who do their science degree from IITs

FIGURE: 5.1

PERCENTAGE OF SCIENCE & ENGINEERING

DEGREES AWARDED TO MINORITIES, 1990 (in U.S.)



SOURCE: NATIONAL CENTER FOR EDUCATIONAL STATISTICS, UNITED STATES.

and later pursue masters or doctoral works go for either university or R & D career only. Those engineers who pursue research at a higher level also pursue academic career generally. Those engineers who pursue management degree in the US, opt for private industry jobs and some of them take to self employment at a later stage. The probable reasons for a very high rate of IIT graduates choosing academics or R&D as their career in the US is two fold - (i)one is the high rate of Asians going for high level research degrees in the field of science and engineering. Figure 5.1 shows that the Asian Americans and foreign nationals together earned nearly 40% of P.hd. in 1990 in the US. The number of Ph.Ds for Indians has to be higher than Asian average as the level of education is high among them compared to other Asian groups. The education level of Indians will show even higher percentage if the total students from India are counted including immigrants and non immigrants. This is really important, as this survey shows that all the IIT migrants had obtained thier doctoral degrees before attaining even immigrant status. As such, the academic positions requiring high level training are more open to Indians. (ii)the other reason is the more suitability of IIT graduates to academic or any other research as observed in the last chapter, which showed that training in IIT is more loaded towards research rather than actual shop floor jobs.

TABLE 5.8

SECTOR OF EMPLOYMENT OF MIGRATING IIT GRADUATES IN THE USA

Sector	Number	Percentage
1. Academics/ Research & Development	51	60.7
2. Private Industry/ Financial Institutions	28	33.3
3. Self-Employment	5	6
Total	84	100

TABLE 5.9

AVERAGE LEVEL OF ANNUAL INCOME OF MIGRATING IIT GRADUATES IN THE USA : 1991
BY YEARS OF STAY

(In US dollars)

Years of stay	Average Income
5-10 (less than 10)	45630
10-15 (less than 15)	62620
15 and above	91240
Total	66497

The average annual income of all the IIT migrants in 1991 turns out to be $66,830 (Table 5.9). This is very high compared not only to the per-capita monetary income of the US taken as a whole but also is comfortbly higher than the average salary of those who had similar degrees (Table 5.3(B)). This average income, as expected changes with the years of stay in the United States - longer the period of stay, higher the income. In fact, if those who were still students are taken out, the average annual income goes upto around $70,000 per annum in 1990-91. During 1970s and 80s, due to high demand, the income for professional speciality occupations rose by a rate against not so high rate of increase in cost or living. This obviously suited IIT graduates well and helped them in receiving highly paid jobs. The high level of income among IITians in the United States, by any standard, indicated their acceptance and success in US labour market.

Regarding treatment in the USA, mainly from the point of view of job and career, the majority of respondents considered it to be good. 60 out of 84 respondents (71.3%) had no complaint against their treatment and did not experience any discrimination either in the job market or at actual places of work. The rest 24, however, felt some sort of discrimination in their treatment; especially at a later phase of their career, when the income had reached particularly high level. Promotions at high level, they felt are biased against them due to race and place of origin. Those who were either in early or middle period of their career felt totally satisfied whereas those who had crossed that stage felt slightly dissatisfied. However, the general feeling was that, despite some discrimination at high level, their work and calibre are well recognised there in the United States.

The Indians are well received by the job market and they have succeeded in US economy. The experience of IIT migrants confirm that Indian scientists and engineers are seen as intelligent and hard working. Regarding immigration, the use of family preference channels and high rate of change from non immigrant states to that of immigrants are also confirmed by the experiences of IIT graduates. However, process of education, training, migration, higher studies abroad, higghly paid job and to see whether this means a total severing of links of migrants with Indian economy or not, we have prepared some cases of IIT migrants, which are going to be presented now.

5.3 CASE STUDIES OF IIT MIGRANTS

In all, fifteen cases have been identified to be discussed. Three considerations have been important in selection of cases - (i) they should cover all the four IITs from which the responses had come, (ii) they should be from all the professions as well as from different disciplines, and (iii) they should be from different time periods of their stay abroad, i.e., migrants who had left the country in 1968 to the migrants who had left the country in 1985. The aim is to include as many type of migrant and

make the selection of cases representative.

CASE 1

'A' was born in 1951 in Bombay in a middle class family. The father had a professional diploma in Radio Telephony and Engineering and a career in aviation. The mother was a housewife with an education upto intermediate level. A had all his schooling in a metropolitan city - Bombay. The family was small as he just had one brother. The monthly income of the family at the time A joined IIT (Bombay) was around Rs.3700/-. He joined IIT in 1969.

'A' had done intermediate in Science from University of Bombay before joining IIT. He completed his B.Tech degree in Aeronautical Engineering in 1974. He did not have any scholarship during his stay in IIT from any source. His monthly expenditure which included tuition fee, hostel rent, mess bills and other expenditures varied between Rs.350 per month(1969) and Rs.650 per month(1974). Before joining IIT he had taken admission in Victoria Jubilee Technical Institute(VJTI), Bombay for a bacholars degree programme in Mechanical Engineering. This means he would have continued his studies there had he been not selected in entrance examination for IITs. The tuition and other fees were higher at VJTI compared to IIT. However, he would not have spent on hostel room rent and other expenses, as he would have lived at home and commuted as a day scholar. Altogether, he feels the private expenses would have been more or less the same amount during his studies even if he had continued at VJTI.

'A' left the country in 1974 - the same year he completed his B.Tech degree - for higher studies in USA. He spent two years as a student in Cornell University and in 1976 received a master's degree in engineering. During these two years (1974-1976) he received freeships and fellowships worth US dollar 4400.00 as well as research assistantships worth US $8700.00. This means he received some subsidy there also in form of freeship and fellowship. Initially A had gone on student visa which was later changed to work visa and then into immigration visa.

'A' started his own consultancy agency after his studies which offers mid to long range tactical and strategic information engineering technology solutions to corporations in the USA. The firm also gets involved in project implementation plans, startups and coordination. A's estimated current income (1993) was US $70,000.00 per annum.

Regarding treatment of Indians in the US he unequivocally states that though Indians do face discriminations and prejudices from time to time as American community is no less strife with class, ethnic and racial differences, they are certainly well respected and considered above average in skills, intelligence and training.

'A' believes migration of HQM to be real problem - which can certainly be treated as brain drain. He realises that intellectual resource is a far more valuable capital than other forms of capital. America and Americans do recognise, according to A, the significance of this intellectual capital and are also aware of the fact that they have the best brains from India available to them. He strongly feels India has lost valuable resources in the form of HQM and along with it the decades of future growth, which that resource could have leveraged directly in economic terms, and indirectly in sociological and political terms.

LINKS WITH THE INDIAN ECONOMY :

A has remitted around US $10000.00 during the sixteen year period (1976-1992). Two thirds of that amount was spent on repairs and renovations of his parents' flat in Bombay. The rest was generally spent by A for his expenses during his stays in India.

'A' does not have any notable investments in India. Though on three occasions in 1985, 1988 and 1991, he brought software development ventures to India involving approximate investments amounting to US $35000.00, none of these ventures were successful in getting off the ground. These were not his personal ventures but by other parties. In 1985, however, he himself had intended to make India his home base again continuing to have a foot in US technology. His professional plans did not reach fruition and in five months time he decided to return to the US again.

About his experience of doing business in India, he feels 90 percent of the efforts go on beating the "system". This results in a poor rate of return, besides the whole process being very exasperating and exhausting. According to him, the fault does not lie mainly with the bureaucracy, as is popularly believed, but is the result of entanglements between vested interests and government policies. On the whole, doing business in India, in his opinion, is tiresome. Nevertheless, he intends to continue to propose joint ventures with India-based solutions because he believes they do make good sense at several levels.

CASE 2

'B' was born in Bombay in 1951. His father was an executive in private sector with a master's degree in engineering. The mother, a science graduate, was housewife. The size of the family was small with only two children. B had all his pre-IIT schooling in Bombay - a metropolitan city. B belonged to a relatively affluent family - the family's income at the time of his joining IIT in 1970, being Rs.7000 per month.

Like A, B also had done intermediate in science from University of Bombay and had a secured admission in VJTI, Bombay for a degree course in engineering. B also had no scholarship from source during his stay

in IIT, Bombay. He left IIT after graduating in bachelors course for mechanical engineering. On an average, B spent Rs.250 per month during his stay in IIT. Alternatively in VJTI, he would have perhaps spent the same amount if the logic applied in case of A is used here too.

Like A again, B also left India the same year he left IIT, for USA to do his master's degree course. He joined University of California, Berkeley and in one year got a degree in Master of Science in Industrial Engineering. He has not mentioned the amounts of fellowship or freeships during this period. He had been working in private sector in the US since then and is currently (1993) working as Vice-President of a reputed firm. He started with an income of US $50000 per annum in 1979, which has increased to US $150000 per annum in thirteen years. He finds his treatment in USA very fair and equitable.

LINKS WITH THE INDIAN ECONOMY :

B is involved with a non profit organisation which is mainly concerned with development support activities in INdia. This organisation has provided support for several development activities, education of children and environment protection programmes. The focus of the organisation is to promote activities that increase self-reliance of the villages and communities. This also aims to create awareness in Indian Youth by financing visits of College students to work in the villages. In fact, he himself had attended such camps organised by the same organisation and was greatly influenced. When he went abroad and settled down, he became an active member of that organisation. He has sent US 5000 - the whole amount for charity - through this organisation. Besides, he himself runs a non profit organisation that also supports rural and environmental development projects in India. He personally sends about Rs.2.5 lakhs per year, distributed to about 4 Non Governmental Organisations(NGOs) across India. All these projects were expected to become self-sufficient in three-four years time by 1997-98.

As a senior member of in the company where he is employed, B started to use Indian software consult-

ants. In a period of 18 months, (1991-92), the employer has provided income of US $200000 through software consulting to Indians (who are in India). In the following two years, they were planning to shift major software development of the company to India. The initial investment from the US was to be in the order of Rs.4 crores with annual turn over of Rs.2 crores in the early years. He personally is planning to make a capital investment of Rs.3 crores employing about 100 persons and giving an annual turnover of Rs.6 crores. He has also invested money in Non-Resident accounts. With a provision of dual citizenship he feels, people will be more inclined to invest in India.

About his return to India B remains undecided. He also considers migration of HQM from India to developed countries a real problem - meaning it involves loss of financial and intellectual resources. B had initially gone on student visa, later changing it to immigration visa within a year. He did not find the process very pleasant. He got his permanent resident status under family preference after marrying an Indian immigrant.

CASE 3

'C', the third case, was born in 1950, in Delhi. Her father had a master's degree in literature and worked as a journalist while the mother worked as a Hindi teacher with a high degree in hindi language. The family was small with parents and three children. C also, like A and B, had her schooling in a metropolitan city - in this case, Delhi. The family's income was Rs.2000 per month in 1970.

Unlike earlier two cases, C did not join IIT for an engineering degree. She had her graduation from Madras University before joining IIT for her master's in 1970 and later continued for her doctorate in Physical Chemistry. All through six years in IIT she kept receiving scholarship on the basis of talent through UGC. For two years in M.Sc. the amount of scholarship was Rs.150 per month and during Ph.D. at

first Rs.250 per month for first two years and Rs.300 per month for last two years. In general scholarship covered half to two third of the total expenditure during her stay in IIT. The alternative available to her was pursuing studies for same degrees in Madras University. She feels that would have definitely cost her less than her stay in IIT. However, she does not give explanation for her feelings.

C also emigrated from India the same year. She finished her doctorate in 1976. She, however, unlike two previous cases did not go on student visa but on an immigration visa. Her husband was already in USA and hence she joined him on a family preference basis. Later, after ten years of her stay in the US, in 1986 she became a citizen of that country. This naturally involved giving up of the Indian citizenship. The main reason for her choice was that she wanted to participate in the voting process of the country she had been living in and feels more comfortable after opting for US citizenship.

In USA, C spent her first year as a post doctorate researcher in department of photo-chemistry in North-Eastern University in Boston on an income of US $800 per annum. After that she worked in one of the research and development organisation for three years in Illinois on an annual income of US $10000. She had to leave that job because of pregnancy when she could not continue working with lethal chemicals. Meanwhile she learnt Spanish and started working in a migrants council, as an English teacher. She liked the job so much that preferred to continue with it rather than going back to scientific environment. Both the level of satisfaction and income was much higher in this job. Her current income (1992) was US $25000 per annum just to work for 4 hours per day as compared to 8 hours per day in a laboratory.

C feels that she has usually been respected for her ideas and attitude there in USA. As for discrimination in the US society, it is, in her opinion, neither worse nor better than in any other place including India. She feels very strongly that having belonged to a different part of India and grown up in some other part, she had experienced quite a lot of discrimination here in her own country.

Her view on brain drain is different from first two cases. She believes this to be a minor issue. She feels the world to be global where people cannot afford to think of oneself only as an Indian or so. And then, according to her perception, a good number of Indian immigrants in the US are contributing to Indian developmental efforts by some way or the other. There are a number of organisations which are working to encourage and support various works helping poor and needy in India, and hence emigrated lot, in her opinion, should not be considered as drain.

LINKS WITH THE INDIAN ECONOMY :

C does not send remittances regularly to her family as nobody is financially dependent on her. She, however, has been regularly sending some amount ranging between US $100 to US $200 per annum to be used by some charitable organisation for developmental purpose through a group in USA, called India Development Service. She has actively been associated with the group which supports projects relating to education, rural development, women's issues, and general awareness in India. She neither has any investments in India nor does she plan to have any in future. She believes more in doing some grass-root level work, which she feels to be more relevant and productive in the long run.

CASE 4

D was born in 1957 in a small place in Karnataka. The father was educated upto matriculation and the mother upto 8th grade. The father was into business and mother a housewife. The family was big with parents and eight siblings. When D was only a child, his father sold about 25 acres of ancestral estate, a house and paddy field - practically everything the family owned to invest in a business. Somehow the business did not succeed and the financial condition of the family became precarious. In 1973, when D joined IIT, the family's income was a meagre amount - around Rs.200 per month. D was very bright and kept

receiving scholarships all through his education. His mother, with the help of loans, made him continue his studies even amidst hardships. Before joining IIT he had most of his schooling in a small town and a part of it in a small city.

D did his master's in Physics from a small city after which he joined IIT, finished his Ph.D. in solid-state Physics in 1978. All through his stay he was receiving doctoral fellowship through Government of India. The amount of fellowship was Rs.500 per month on an average and his expenses were Rs.350 per month. This means he was able to save around one third of the fellowship amount to support his family. Any other alternative would have cost him more, he feels. He, however, is not sure what he would have done if not got into IIT.

He went to USA in 1978 - the same year he finished his doctorate in IIT. He went as a post doctoral research associate. As such he did not get any degree there in USA. After three years he became a scientist in Massachusetts Institute of Technology in Cambridge. MIT applied on his behalf and without any problem he received the permanent immigration visa. He feels if one is highly educated, can speak good English and employed in a good place, getting immigration visa is not at all difficult.

He believes the brain drain to be a real problem but feels that there is no straight forward and simple solution to it. He considers bureaucracy, nepotism and corruption to be mainly responsible for hindering migrants to return. He finds his treatment in USA slightly biased in case of promotions though otherwise he does not feel much discrimination.

LINKS WITH THE INDIAN ECONOMY :

D had started with an income of US $12000 per annum as a research associate in 1979 and in 1992 he was earning US $43000 per annum as a Research Staff Scientist in MIT. All through these years he had been

sending remittances amounting to US $6000 per year, on an average. Around half of the remittances were spent on marriage of four sisters and a brother, paying back all the loans taken by his parents over the years and on family living expenses in India. The other half was spent on buying the land and starting coffee plantation there. Coffee plantation was started in 1985. It was handled by one of his uncles for three years in the beginning. After that it has been managed by D's brother in law. Total finances belong to D and he is consulted before taking any major decision. The area of the estate was 10 acres which they were planning to increase by another two acres. He is planning to set up some irrigation set up also. Along with coffee, there is some pepper and cardamom inter-plantation also.

The coffee estate employs eight persons permanently and a few more persons periodically. Permanent employees have free housing inside the estate with clean drinking water facility. They are also paid well, taken care of health expenses, given yearly bonus. Initial investment in the plantation was about Rs.100000. After that it costs nearly the same amount per year. So far the income is on the order of 5-10% of the annual expense. However, they expect the return to even out in a years time (1993-94). D plans to use that return in India only, perhaps to expand the cultivation business.

He had not made any other investments till he responded to the questionnaires. He, however, intended to invest in shares, provided stock market is reliable and trustworthy. He felt that it would be better if shares are handled by some major brokerage firms in the US. Regarding transfer of intellectual resource, he feels that a central pool kind of a system would certainly help. He himself had not participated in any consultancy or project in India till then but was willing to do so in the long run, if there is a system to channelise this in the proper way.

CASE 5

E was born in 1952 in Bombay, where he had all his schooling till he joined IIT. His father was a share broker with a graduate degree in Commerce and mother, a trained school teacher. The family had 6

members including parents and four brothers and sisters. He has not mentioned the income of the family at the time of his joining IIT. However, parents professions make it obvious that the financial position of the family must be comfortable.

E joined IIT Bombay in 1969 to do his bachelors in Mechanical Engineering. He completed his B.Tech in 1974 and had no scholarship during his stay there. He, on an average, spent around Rs.300 per month during his stay in IIT. The alternative available to him was to take admission in a course of general sciences in St. Xaviers College, Bombay. He feels that his study and other expenses would have been either same or more than that in IIT.

E also, like all previous cases went to the US the same year he finished his B.Tech. In the USA he spent his first one and half years as student and finished his Masters programme in Business Administration (MBA). He had gone on a student visa initially which was changed to work visa after one year of stay. After three years of stay, his company helped him to secure an immigration visa without any difficulty. After keeping Green Card (immigration visa) for fifteen years he became a citizen of the US.

E, after finishing his MBA degree in 1976, joined the work force as a programmer in a private company with an yearly income of US $13500. IN 1980, he changed his company and became a database specialist with an income of US $30000 per annum. Later, he became marketing manager in 1983, on an income of US $40000 per year. In 1984, he left the job and started working independently as a consultant. Between 1984-86 his income varied between US $30000 - $50000 per year. Since early 1990s, he has been earning more than US $100000 per year, as in independent consultant.

He also considers the migration of HQM a drain and holds corrupt, cumbersome and counterproductive system to be responsible for it. Regarding his treatment in the US he feels that it could not have been better. Though the American society is full of discrimination, in his opinion, he was saved to certain

extent because of his very fair complexion. Being a Zorastrian Parsi, he could easily pass off as a westerner except his accent. Besides, Indians are usually considered very intelligent, smart and best of workers according to him, and this helps them in getting a fair treatment.

LINKS WITH THE INDIAN ECONOMY :

He has not been sending any remittances to India regularly. Nor has he made any investments in Indian economy. He had planned to open a data collection centre in Bombay area, employing about 40-50 people. When he researched the feasibility of moving his effort to India or contracting it out to people in the Phillipines, he found that he could send parcels to the Phillipines in one day, but it took at least three to four days to get to India. This was not timely enough for his data base needs. Though he is still looking into this proposition, but feels unsafe because of inadequate infrastructure.

E also planned to invest in stock market. He feels that people like him have an almost unlimited choice of where in the world to invest, and in the types of investment vehicles (stocks, bonds, commodities, real estate, mortgage loans, bonds, etc) available to them. They would certainly prefer India, this being their home country, provided the process is not complicated and time consuming. He has outlined certain deficiencies in the operation of the stock markets - a cumbersome settlement process, lack of adequate regulations to prevent market manipulations, lack of investor protection and lack of liquidity. He welcomes the idea of double citizenship as it would give him a confidence of having all the rights of a citizen, in making investments.

CASE 6

F was born in 1961. He was brought up in a small city - Ranchi where he had most of his schooling. His father is an engineer with a degree in electrical engineering and mother a housewife with a matricula-

tion degree. Father worked with a public sector company with an income of Rs.3000 per month in 1978 - the year F joined IIT. They had a small family with three siblings.

F joined IIT Delhi in 1978. In 1983, he finished his course in Mechanical Engineering with a B.Tech degree. F would have joined either some other engineering college or Bachelors course in science and feels any other course would have cost him the same amount. He spent around Rs.600 per month during his stay in IIT.

After leaving IIT, he took up a job in Delhi with a private company. The experience was not at all satisfying for him. He tries to explain his case by quoting one example of how, after a brilliant career in IIT, he was usually asked by his boss to go and get company papers photocopied. This, however, cannot be cited as the reason for his migration as he had already decided to go to the US for his masters degree. In 1984, he went there to do his master in science on a student visa after one year. In 1986 he applied for immigration visa and got it within 9 months, without any difficulty. He also feels that for professionals there is no difficulty at all in getting an immigration visa.

After his M.S. degree he joined the work force in 1985. He started with an income of US $31000 per annum and after two job changes, worked with a Research Organisation with an income of US $60000 per annum in 1991.

He feels totally satisfied with his treatment there in USA. In his opinion, the extent of freedom in work and research is unthinkable in Indian companies. He does not consider migration of HQM a drain as, in his opinion, this relieves an already crowded Indian job market of some people. Besides, he feels, emigrants usually are helping India by making investments. Added to that every Indian working abroad is doing a public relations job for India, according to him, and this is helping India create a positive picture to seek foreign investment. For five years he continuously sent around US $4000 per year to his

family.

LINKS WITH THE INDIAN ECONOMY :

The organisation where F works develops software and planned to move its software development efforts from the US to India (in Bangalore). The reason was the perception of the organisation that Indian graduates were better in quality and sincerity than US graduates and the shift would be cost effective for the company.

F opines that India banking system is sub-standard, cumbersome and time taking. He considers it a major hindrance in sending remittances. Though he does not have any investments, he plans to invest in real estate and development bonds. The reasons for making investment in bonds are both high returns and a sense of pride to help India's developmental efforts. He also names lack of confidence in Indian stock market as one obstacle in investing there. Like others, F also welcomes the proposal of double citizenship.

CASE 7

G was born and brought up in a metropolitan city, Bombay. He was born in 1953. His father was a matriculate and mother had passed 9th standard. The mother was a housewife and father did his own business at a small level. They were four brothers and sisters. IN 1970, the family's income was around Rs.1000 per month. G did all his schooling in Bombay.

In 1970, G joined B.Tech course in Civil Engineering in IIT Bombay after having done his intermediate science from Bombay University. He received merit-cum-need scholarship during his stay in IIT amounting to approximately Rs.2000 per year. This took care of almost all his needs in IIT. If he had not got into IIT, he would not have joined any other institution and discontinued his studies for a job.

After completing his B.Tech in 1975, he went to visit United Arab Emirates (same year) on a tourist visa. During his visit he found that there are scopes of earning some money and in order to avail that opportunity, he immediately changed his visa to that of an employment category. Now he is working with a manufacturing firm with an income of more than US $100000 per annum.

LINKS WITH THE INDIAN ECONOMY :

G's entire family is dependent on him. He has been sending regular remittances to them all these years. In fifteen years he has remitted more than Rs.5 crores, 95 percent of which is for investments in various forms. He has invested in various forms like External (NRE & FCNR) deposits, equity participation etc. In future also, he plans to continue his investments in Indian economy in one form or other. From investment point of view, decline in value of rupee and cumbersome bureaucracy are his primary concerns. He is not very enthusiastic about the proposal of dual citizenship.

Besides making huge investments in India, he, as Managing Director of his company, also promotes the use of Indian materials as well as Indian labour. He found treatment there in UAE tolerable in the beginning and fairly good later. He perceives brain drain to be real as well as inevitable and hence feels that country should try to make best of it by promoting participation in all possible forms and manners. He is living in UAE for purely commercial reasons and will continue to do for several more years.

CASE 8

H was born and brought up in very small town in Kerala in 1955. His father had a Master's degree in

accountancy and mother had a Master's degree in Arts as well as a bachelor's degree in education. H belonged to a small family and had only one sister. In 1974, when H joined IIT, his father had retired and family's income was Rs.600 per month.

H had done his pre-degree course before joining IIT in 1974. He did his B.Tech in Mechanical Engineering form IIT Madras. During his stay in IIT, Madras, for five years, he was receiving merit-cum-means scholarship amounting to Rs.150 per month. If he had not got into IIT, he would have joined some other engineering college which would have cost him, he feels, roughly the same.

H left the country in 1982, three years after he left the IIT. He has not mentioned about his occupation during that period. He went to USA as a student on a student visa to do his MBA from University of Minnesota. He changed it to work visa after a stay of two and half years, in the beginning of 1985. He applied for an immigration visa in September 1985 and got one in March 1987. The process was lengthy and expensive and cost him a legal fees of US $7000. During that period he could not come to India.

H joined the American Labour Force in 1985 as a Systems Analyst and became manager after two years. After few years he started working as consultant. His initial income was US $32000 per year and his latest income(1992) was US $64000 per year.

H considers brain drain to be inevitable. He certainly feels discriminated in the US especially in promotion and at a higher scale, generally after crossing US $50000 annual salary mark. But at the same time, continues to live there because his life is less confined, more free and standard of living is high. Tremendous educational facilities also help in keeping him back.

LINKS WITH THE INDIAN ECONOMY :

H had remitted around US $2000 per year to both his parents and his sister. During ten years period

he visited India four times and spent $6000 in India. He finds existing facilities sufficient except that they take too long to cash a Cheque.

H has invested around US $13000 in Non-Residnet accounts. He would have invested in India Development Bonds if he had enough money to do so. He feels if brokers in the US could be authorised to collect money and disseminate information, that would have been better. Regarding Indian Industrial climate also, he feels, he and other fellow Indians in the US are not so well informed.

Regarding use of his education, training and experience for Indian development purpose also, he opines that some sort of a programme to fill temporary posts in industry, R & D institutions with people like him would be a good idea. He would be happy to come to India on any such attachment for a period of few months.

H welcomes the idea of dual citizenship with great enthusiasm. Because of emotional ties he does not want to give up Indian citizenship. He wants to come back and try some business in India, keeping his option of going back to the US open. With a Green Card he cannot stay in India for more than a year at one stretch. With a dual citizenship these things would become easier.

CASE 9

J was born in 1960. Both of his parents had doctorate degrees and both were professors. The size of family was small with two siblings only, he himself and a sister. He had his schooling in a town in U.P. before joining IIT, Delhi. The family's income in 1976 when J joined IIT, was Rs.4000 per month.

J had done higher secondary before joining IIT, Delhi. If he had not joined IIT, he would have joined some other engineering college which would have cost him the same. He completed his B.Tech in Electrical Engineering in 1981. In IIT, on an average, he used to spend around Rs.300 per month.

J went to the US in the same year he had graduated from IIT, 1981, on a student visa. There he did his Masters and doctorate from Stanford University. Later he joined Cornell University as Assistant Professor. He has not mentioned his incomes at various stages. Initially he had planned to return after studies. But now he is undecided and for the time being postponed it.

After three years of his stay in USA, he changed his visa category from student to work. In 1985 he applied for an immigration visa and got it after a year. He found the process time- taking and bureaucratic.

He has no complaint against his treatment in USA. He, however, considers the migration of HQM to developed countries to be a serious problem for developing countries and feels India would be fully justified in stopping it.

LINKS WITH THE INDIAN ECONOMY :

J does not have anybody dependent on him financially, back in India. Hence, he does not send any remittances. He has not made any financial investments either. However, he finds the liberalisation of the economy a change on the desirable line. He feels that convertibility of currency would be a great help.

He also welcomes the proposal of dual citizenship for the same reasons which were cited by H. People who want to come back to India and try whether they are successful and acceptable in India would be very secured with this facility. They will be able to maintain bank accounts, etc at both the places. Regarding academic relationship with India also, he holds views similar to H. Some central body to coordinate

and arrange for temporary placements would certainly be successful in his opinion. He would also certainly like to come and join some institution for a short period of time. He, in fact, plans to interact with people at technical institutes in some way - what way, this he had not decided.

CASE 10

K was born in 1953. The father had a Master's degree and mother was intermediate pass. The mother was a housewife and father a professor in an engineering college. K had one brother, and a sister. He had had his all pre- IIT schooling in Madras - a metropolitan city. The family's income was Rs.3000 per month at the time of his joining IIT.

K joined IIT, Madras in 1970 for his B.Tech course in Mechanical Engineering. After finishing B.Tech., he joined M.Tech in the same IIT, and finally left it in 1977, He had no scholarship in IIT. He spent around Rs.300 per month in IIT. He would have taken admission in general engineering college in Madras where he would have stayed at home. This would have, he feels, reduced the costs of his studies. After that he started working with a Public Sector Company(BHEL) at Madras. He was working as Senior Product Engineer, when he went to the US in 1983 to do his Ph.D. However after going there, he resigned from the job and continued to live there. He had gone on a student visa, which was later changed to work visa in 1990. At the time of responding (1992) he was going through the process of getting immigration visa.

After finishing his Ph.D from University of Connecticut in 1990, he started working as Research Associate in the same University. As a student his income was US $9000 per annum and he was receiving US $40000 per annum on his job in 1992.

He had initially planned to return after doing Ph.D. Later he changed his plan and decided to take permanent resident status. He feels that there are more positives than negatives in his treatment there in USA. He considers the migration of HQM to be a serious problem for a country like India. He feels the whole phenomenon is sad and deplorable and should be stopped.

LINKS WITH THE INDIAN ECONOMY :

K does not send any remittance to anybody in India. Nor has he made any investments in any form. In fact, he felt that he had just started earning enough to save and make some investments. Hence, he had started considering various opportunities available and was motivated to invest in India. He also considers the proposal of dual citizenship good for Indians residing abroad. This is because, he feels, people will invest more if they know they are citizens of that country.

CASE 11

L was born in a big family. They were eight brothers and sisters. Both the parents were educated only upto primary school level. The father used to run a small shop and the mother was a housewife. L was brought up and had all his schooling in Bombay - a metropolitan city. The family's income at the time of L joining IIT in 1989 was Rs.500 per month.

Before joining IIT he had his intermediate in Science from Bombay University. From IIT, he did his B.Tech in Chemical Engineering. During his stay in IIT, he received merit-cum-means scholarship amounting to Rs.100 per month and his expenses were Rs.150 per month. He would have done engineering course only, from Bombay University, if he had not got into IIT, where he would have spent around Rs.100 per month.

L went to USA, the same year he left IIT - 1974 on a student visa. His visa was also first changed to work visa and then to immigration visa. He did his Ph.D and then MBA there in USA. He is working with a firm as Senior Engineer. His initial income was US $21000 per year and current (1992) was US $65000 per year.

Regarding his treatment in USA, he feels that in technical work Indian engineers are considered to be top ranking in the world both in universities as well as at work place. In management, however, they are not accepted as much. But, he feels, perception is changing fast and since they are doing very well economically they could a source of resentment in future.

L does not consider the migration of HQM a drain of brains. He would rather prefer to call it a surplus technical manpower which overflows. He opines that India does not have enough of technology base to utilise the technical know how which his kind of people possess. Besides, after some years of work experience, they are in a better position to help the country. Also most of Indian migrant professionals are reaching a point (both financially and technically) where they can make things happen through family and friends, back in India. He feels that like Koreans and Taiwanese people, Indians will also start either going back or having business ties with home country in a period of 5-10 years, when the Indian economy becomes more mature.

LINKS WITH THE INDIAN ECONOMY :

L has consistently been sending remittances to his family amounting to US $3000 every year. 90 percent of this amount is used for consumption purposes and the rest is invested by the family.

L had made no investments till then. However, he was planning to invest both in company shares and directly in manufacturing. He found the NRI policies to be encouraging and felt that dual citizenship would make him more confident in investing in Indian economy.

Case12

M was born in a 1960 in a town in Rajasthan. He had all his pre-IIT schooling in Ajmer, a town in Rajasthan. His father was educated upto high school and had retired after working as a Government Clerk before M joined IIT. His mother was a graduate and taught in a Nursery school. Their family was small with two children and the family's income was around Rs.1000 per month in 1977, the year M joined IIT.

M had done his higher secondary before joining IIT, Delhi. He joined IIT in 1977 to do his B.Tech in Chemical Engineering. He used to spend around Rs.100 per month in IIT during his stay there. He received scholarship during his stay in IIT. M was also selected for special class Railway Apprentice Programme (SCRA) through UPSC and he would have joined that if he had not got through IIT entrance examination. Since SCRA programme pays stipend which is enough for covering all the expenses, he would not have spent any money for his studies.

M went to the US in the same year he finished his B.Tech - 1982. He went on a student visa and did his Master of Science in Chemical Engineering from Segracuse University. After finishing his studies in 1984, he joined a private sector company in USA as a Process Engineer. He was continuing with the same company as Process Engineering Manager after seven years. His initial income was US $31500 per annum and his current income (1992) was US $63000 per annum.

M feels that brain drain is a non issue. There is no real brain drain as there is enough brain power and talent left in the country. Though he carries a sense of guilt for having received subsidised education he hopes to repay the country in the form of investments and eventually through some entrepreneurial

activity. He feels that incentives for NRI investments should be further promoted which would bring in much needed foreign exchange into India. Recognition of dual citizenship, tax incentives upon return, etc. would encourage NRI investment further.

LINKS WITH THE INDIAN ECONOMY :

In the period of seven years of his job he had remitted around US $3000 per year to his family mainly for consumption purposes. His wife also happened to be an IIT Delhi graduate from the same batch. She is also his colleague in his firm. Together they have invested in real estate in Delhi and Bangalore as well as in Non-Resident Bonds. Though they have taken immigration visas, they intend to come back to India after some years. They are planning to return and spend about half a year in India and other half in the United States. He finds his treatment in the US to be fine.

CASE 13

N was born in 1956 and had his schooling throughout in Madras - a metropolitan city. His father was a matriculate and runs his own business. His mother, also a matriculate, was a housewife. The family had five members including three children. In 1974, the family's income was about Rs.3000 per month.

N had his pre-university certificate before joining IIT, Madras. He joined IIT in 1974 for his B.Tech course in Chemical Engineering. He had no scholarship during his stay in IIT. He used to spend Rs.350 per month during his stay in IIT. He would have taken admission in Guindy Engineering College, Madras if he was not selected for admission in IIT. Education in that college would have, he feels, cost him roughly the same amount as it did in IIT Madras.

After finishing his B.Tech in 1979, he went to the US the same year on student visa. He spent five

and half years as a student there while doing his master's and doctorate. In 1992 he was working as Associate Professor in University of Colorado. After his Ph.D he started working with an income of US $40000 per annum which went upto US $65000 per annum in 1992.

Initially, he had thought of returning to India after his studies. Later he changed his plans and decided to stay back in the US mainly for two reasons higher income and professional satisfaction. Doing research at the frontiers of an emerging technology had its own attractions. Additionally, at the completion of his doctoral studies, he felt that he would not be directly useful to either the Indian economy or to the American industry and found himself more suitable for a academic research career. He feels that his research activities in modern biotechnology have more relevance and applicability to either economy.

Regarding his treatment in the US, N feels that racial discrimination and other limits to growth are there, but below the surface. He opines that the treatment in these things is not worse than one arising out of caste wars and political connections in India.

N believes that in India, brain is commonly wasted in dealing with mundane and old fashioned problems, due to lack of facilities and modern technology. An Indian brain cultivated in modern technology and research is potentially more useful to the Indian economy, than if it is rooted too deeply in the Indian soil, according to him. With the current lack of vibrant scientific research activity and economic rewards for the academic brain, migration of HQM is bound to continue.

LINKS WITH THE INDIAN ECONOMY :

He has been sending US $100 per month over a period of ten years, 98% of which is spent on consumption by his family. He has also invested US $4000 in NRI Series II Bonds and Rs.50000 as fixed deposit in

a nationalised Bank.

N has maintained close contacts with Indian academicians, particularly in IIT, Madras and Indian Institute of Science at Bangalore. He keeps giving research seminars at these and some other institutions on his personal visits to India. He also plans to initiate an industrial biotechnology venture in future. Biotechnology is his area of research.

CASE 14

P was born in 1950 and was brought up in a small city, Lucknow. She had all her schooling there till she joined IIT, Kanpur. Her father was an engineer and worked with U.P. Government. Her mother, a highly educated women with a Master's degree was a housewife. They were four brothers and sisters.

P joined IIT, Kanpur in 1966 and graduated in 1971, with a B.Tech degree in Electrical Engineering. During her stay in IIT, she received merit scholarship from UP Board. She would have received this scholarship in any other engineering college also, as it was on the basis of her performance in intermediate examination. If she had not taken admission in IIT, she would have joined any other engineering college, which would have cost her the same, she feels. She used to spend around Rs.200 per month, half of which was covered by scholarship amount.

After finishing her B.Tech, P went to USA the same year, to do further studies. In two years time she finished her Masters in Science degree in Electrical Engineering from Brown University. After that she joined a company in the private sector in the USA and worked there for one and half years. After that, she got married and together with her husband, moved to Canada. In Canada she first worked in the private sector for three and half years, then in the Government sector for nine years and finally in a University for three years. Altogether she spent eighteen years abroad - three and half in the US and

fourteen and half in Canada. After that, she and her husband, an economist, decided to move back to India, along with their children. They came back in 1989 and set up a private consultancy firm here.

She had gone to the US on a student visa which was later changed to that of a temporary worker. In Canada she had taken an immigration visa and had no problems in getting one, as engineers were sought after professionals there at that time.

P had initially planned to come back just after her studies in the US and start a small scale industry in Kanpur. She changed her decision mainly because of her husband's decision to stay back abroad. She feels that some sort of discrimination is certainly there both in the USA and Canada but it does not really affect if a person happens to be efficient. She feels that despite being belonging to doubly disadvantageous group (being an Indian - a foreigner and a woman) she did not feel discriminated against because she had the brain, efficiency and sincerity. She also feels that Canada is the best country to live in as a visible minority. Canada has various social policies for protecting and encouraging minorities which really help them. Since she had worked at a senior level in both private and public sector of Canada and at middle level in University as well, she could say so with conviction.

LINKS WITH THE INDIAN ECONOMY :

She, along with her husband, had been sending remittances to her husband's family regularly. During the sixteen years of her stay abroad while in job, she regularly sent around Rs.25000 per year - mainly for consumption purposes. In Canada, she used to get tax benefits for remitting to non-resident dependents. While she was there, she had also invested in various Non-Resident accounts. She had also bought shares of Indian companies. NRE and FCNR accounts, of course, have ceased to exist now as they have become residents of India.

Before coming she had applied to CSIR for consideration in Pool scheme. She was offered a place in it but she did not made use of it and decided to start her own consultancy. She, however, feels that scheme to be good which gives a sense of security to those Indians who want to return from abroad. But, at the same time, she also feels that state and quality of Industrial Research has fallen to a great extent in India and one does not feel motivated to become a part of it. Hence, though one important reason for her return was a desire to work in India for its development, she preferred to do it through private consultancy rather than joining any institution. She felt that she owed something to this country for the highly subsidised education she received all through, especially at IIT and must do something about it. This was one motivating factors in her decision to return. In the four years of time, which she has spent in India after coming back, she has found her work here very enjoyable and satisfactory. She feel that she has been able to use her knowledge in providing perspectives and applying techniques for country's development through consultancy. After coming back, she and her husband, had invested a good sum in establishing their consultancy project as well as on a house. They have two full time and two part time employees. Though the husband goes abroad for summer teaching assignments, neither of them has any plan to go back permanently. Though, they faced bureaucratic obstacles, these do not de-motivated them from their decision to live in India. She, however, certainly finds the simple things like getting a telephone or gas connection or securing admission of children in a school very tiresome as compared to their stay in Canada. Despite all these, she strongly feels for India and considers brain drain a real problem.

CASE 15

Q was born in 1946 and had all his schooling in Lucknow - a small city. His father had not received any formal degree. He worked as an accountant with some private company and had a meagre income. The mother was uneducated and was housewife. They had a big family with eight brothers and sisters. Financial-

ly, the family's situation was difficult.

Q did his intermediate in science from Lucknow University in 1962. After that he got admission into IIT Kanpur for an engineering degree course in Civil Engineering. He received a national scholarship during his five years stay in IIT, amounting to Rs.250 per month. This took care of his entire expenses during the period. The source of his scholarship was Government of India. If he had not got into IIT, he would have joined B.Sc. in Lucknow University. However, he could not assess the difference in cost of these two types of studies.

Q went to US in 1967, just after finishing his B.Tech. He initially went on a student visa and did his master in science in Systems Engineering as well as Master in Arts in Transportation Systems in two years time. He later changed his visa to training and then to immigration category in 1972. Though there was no problem in getting an immigration visa, there was a hitch as it meant application of compulsory Army Draft. During those days, all permanent residents were subject to this and the call for Army service depended on lottery.

Regarding his treatment in the US his response is not very different from others. He also feels that biases and discriminations are there but they are certainly overt and it is difficult to find them outwardly. The higher one goes in the job, more discrimination he/she has to face. He also reveals probable explanation for not so overt bias or discrimination. There are legislations against such biases and hence the Americans obviously cannot outwardly resort to actions against themselves. At the same time, Q also feels that despite these internal biases, there is certainly much respect and recognition of work and talent.

LINKS WITH THE INDIAN ECONOMY :

Like P, Q is also a case of return migration. After spending two years as student in the US, Q took up a job in the private industry there. He started working as Statistical Analyst in an Insurance Company and continued there for ten years. Ten years period is generally required for social security benefits, etc, there in the US. After changing his job he joined another company as Manager, technical service. His initial income was US $11000 per annum in 1969 and his last income was US $72000 per annum in 1992. After twenty five years of stay in the US, he moved back to India in 1992. All these years, he was mainly involved in Computer Management and had hardly anything to do with Civil Engineering, his basic discipline in IIT, Kanpur.

During the initial ten years of his stay in the US, Q sent remittances amounting to US $30000 to US $40000 in total. This money was mainly used for paying off loans taken by him and his family and for consumption purposes of his family. Around 10 to 20 percent of this amount was invested in business by his brother. Q had invested around Rs.2 lacs in NRE account and US $10000 in FCNR account. He feels that share market, working in India lacks confidence and banks do not function efficiently and fast enough to attract investments from persons who are used to a very speedy and efficient system. He expressed his inability to understand why Indian companies take upto a year in allotment of shares. An investor is not sure during the period whether he is going to get a share or not. He feels that people settled in developed countries do not invest in the Indian market for short term speculative gains but for long term capital gains. Hence, they should be given an efficient service.

Q also returned because he wanted to work in his own country. In fact, he had been trying to return since quite long. But he feels, situation back in the country is not at all conducive for returning NRM migrants. He had offers of several jobs in his hands but preferred not to take them on the basis of not

so good experience of his friends. He opines, that returning migrants are treated suspiciously by their colleagues in India, and are also discriminated against. This is, however, not his experience and perception. Besides, there is a real problem of adjustment in many senses especially for the children. After getting used to an efficient system including transport, communication, banking etc., one finds it very difficult to accept and adapt to a system, which according to him, hardly functions. Q is himself trying hard, along with his family, to adjust to these changes. He feels that most of the HQM migrants want to return after several years and there is no scheme or system to channelize their return or to motivate them to return.

Q was associated with an association which worked to help different schools, colleges and libraries, while he was in the USA. He feels that there are many Indians who want to remit some part of their income to charitable trusts in India engaged in some developmental purposes, but are not aware of the avenues. There are two reasons for such act - one is a feeling of satisfaction derived from contributing to a cause related to one's own country which somehow lessens the guilt sense which they carry and other is simple economics in form of tax deduction they get. Q feels there should be schemes to tap this resource. He himself has made a proposal to set up an Non-Resident Indian (NRI) Scholarship Fund in order to provide scholarships to bright students in different areas and at different levels. He has submitted the proposal to a body of NRIs for consideration. Such schemes can be developed and worked out successfully, he feels.

These case studies have brought forth certain important aspects associated with HQM migration, especially regarding their links with Indian economy. However, before coming to that one interesting point needs to be outined here. In the previous section it was seen that almost 93 percent of IIT migrants entered the U.S. on student visa. Case studies revealed that most of the IIT passouts migrate immediately after completing their course in IIT and spend several years as students there before joining labour market. This means that in most cases, the country of destination add to their input of education

and training. This fact needs consideration as for such cases it means the final scientist or engineer who joins the abour force in the US is a product of both Indian and American education and training and not only Indian education.

To come to the point of links of emigrating professionals with Indian HRM broadly two types of links can be identified - financial and human capital. Most of the IIT migrants seem quite keen to have some sort of interaction with Indian economy. Remittances are sent generally to families and in some case to voluntary organisations to be used for development purpose. Some of the migrants, especially those who have taken to self-employment abroad seemed most eager to have some business ties. Their experiences, however, in this regard revealed that infrastructural bottlenecks are the biggest hurdle in the way of direct or portfolio investment.

As far as return migration is concerned, the cases show that they have huge amounts of finances and long years of experience which can be used for country's development, if directed towards right kind of investment and approached properly.

All these bring us to the question of Indian response in the form of policies and programmes to these inflows. The following two chapters deal with the question.

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CHAPTER VI

THE INDIAN RESPONSE :TRENDS AND POLICIES RELATING TO FINANCIAL FLOWS

Human capital generates two types of resources : more human capital and capital stock in money terms. The financial and human capital that the emigrating HQM carry with them when they emigrate and ideally keep on accumulating as they are employed in the work force. Therefore, the set of policies a country can adopt with respect to the emigrating HQM has to address two subsets of outcome that can be stated in terms of (a) financial flows and (b) return flows of human capital (in the form of technology transfer, actual repatriation and so on). Though India does not seem to have developed a comprehensive set of policies in this regard, there exist a number of programmes involving the migrating individuals and they need to be examined to analyse Indian policy. This chapter looks at the financial aspect, leaving the human capital aspect for the next chapter. In order to assess the impact of these policies and to identify the lacunae, the trends in associated financial inflows have also been analysed both at macro level and at micro level as evidenced from survey of emigrating IIT graduates.

India does not have any policy of compulsory taxes or any other public finance measure to recover or compensate for the financial outflows associated with HQM migration. However, a number of monetary measures can be identified which has implications for emigrating HQM.

Indian Government has started certain schemes of bank accounts specially meant for Non Resident Indians (NRIs). Similarly, there exist various schemes which are, directly or indirectly, relevant for direct investment by them. However, before going into the details of these schemes, it is necessary to know the exact definition of Non Resident Indian.

6.1 DEFINITION OF NON RESIDENT INDIAN(NRI):

Section 2(P) and (Q) of Foreign Exchange Regulation Act (FERA), 1973, provide definitions of a Resident and a Non Resident in India for exchange control purposes. The definition of a Resident and Non Resident for income tax purposes is provided in Section 2(30) of the Income Tax Act and it is different

from the definition of a Non Resident Indian in FERA, 1973. All references to a Resident and a Non Resident for banking purposes is in accordance with the definition contained in FERA, 1973. According to this an NRI can be defined as:

(a) Indian citizen who stay abroad for employment or for carrying on a business or vocation or for any other purpose in circumstances indicating an indefinite period of stay outside India.

(b) Indian citizens working abroad on assignments with Foreign Government/government agencies or Investment/Regional agencies like UNO and its affiliate bodies, World Bank, IMF etc.

(c) Officials of the Central and State Government and public sector undertakings deputed abroad (including diplomatic missions abroad).

Note:Indian citizens who proceed abroad for higher education or medical treatment irrespective of their period of stay abroad are not treated as Non Resident.

The persons of Indian origin also have almost all the concessions which the Government of India provides to an NRI. Persons of Indian origin include:

(i) A persons who at any time held an Indian Passport or he/she either of his/her parents or any of his /her grandparents was an Indian or a permanent resident in undivided India.

(ii) Wife of a Non Resident Indian or of a persons of an Indian origin is also deemed to be of Indian origin even though she may be of Non Indian parentage or origin.

Barring a few, most of the facilities which are available to NRIs (as defined earlier, including person of Indian origin) are also made available to overseas corporate bodies predominantly owned by NRIs. Overseas corporate bodies are defined as companies, partnership firms, societies and other corporate bodies which are owned directly or indirectly to the extent of at least 60 percent by individuals of Indian nationality or origin residing outside India and also overseas trusts in which at least 60 percent of the beneficial interest is irrevocably held by such persons.

The definition of NRIs for banking purposes seems to be vary broad as it includes persons of Indian origin as well as overseas corporate bodies and Trusts. The definition of NRI for income tax purposes is much narrower in comparison showing the fact that the country provides facilities to maximum number of persons under NRI schemes but only a part of this lot comes under Income Tax Laws. This makes it obvious that the purpose of providing banking facilities to more people is to attract foreign exchange investments rather than anything else.

6.2 POLICIES CONCERNING REMITTANCES AND BANK ACCOUNTS:

NRIs can hold several types of accounts in authorised banks in India - some of them can be held in foreign currency and some only in rupees. Two types of rupee accounts viz. Non Resident (External) Rupee Accounts (NRE Accounts) and Ordinary Non Resident Rupee Accounts are permitted to be maintained. These accounts can be opened by an authorised dealer/bank without prior permission of Reserve Bank of India. Funds for opening of or credit to NRE Accounts have, however, to be remitted from abroad or tendered in the form of foreign currency notes, travelers cheques etc, while on a visit to India. The difference between NRO and NRE accounts is that local funds which do not qualify under the exchange control regulations, for remittance outside India are required to be credited to NRO accounts and funds remitted from abroad and which are of repatriable nature can be credited to NRE accounts. Upto US $10,000 or its equivalent representing proceeds of foreign currency notes/travelers cheques can be credited in NRE accounts during their visit without any restriction. For amount exceeding that, they can be allowed to credit provided they were declared to the customs in the currency Declaration Form at the time of entry to India. Credits to the accounts of funds emanating from a local source would be permissible only if the funds are of repatriable nature and can be remitted by the account holder abroad Debits for local disbursements are allowed freely in NRE accounts.

The accounts can be maintained in any form i.e. current, savings or Fixed Deposit Accounts in both NRO and NRE schemes. While in the case of NRE accounts, the interest rates are fixed by Reserve Bank, banks are free to determine the interest rates in the case of NRO accounts as in the case of domes-

tic deposits. Interest rates on NRE accounts have been aligned with domestic deposit rates from October 1992 and they must not exceed one percent above the maximum domestic deposit rate. Banks in India have been authorised to allow repatriation of funds held in NRE accounts freely. Funds held in NRO accounts which would generally be from a local source cannot ordinarily be repatriated outside India. Reserve Bank would consider repatriation of such funds on the merit of each case provided it is satisfied that the funds are of a repatriable nature and have not also lost their identity.

One more type of bank account - Non Resident (Non-Repatriable) Rupee Deposit scheme, exists under which NRIs as well as other Non Residents (i.e. foreign citizens, normally residents in India, during the periods of their stay outside India or office and branches of companies, firms, etc. whether Indian or foreign, situated outside India) can keep deposits with banks in India. Such an account can be opened with an authorised dealer in India by remitting funds from abroad in any convertible foreign currency. NRIs can also open such accounts by transferring funds from their existing NRE/NRO accounts. Deposits designated in rupees can be kept for periods ranging from 6 months to 3 years. These deposits are not subject to the interest rate regulation of Reserve Bank. Hence, banks are free to determine the interest rates under the scheme. Either the principal or the interest accrued on such deposits cannot be repatriated outside India at any point of time, as the name itself suggests.

National Defence Remittance Scheme Special Accounts (NRDS Special Accounts) were the other form of rupee accounts, introduced during 1965-66 by the Government of India. These accounts were opened in the name of non residents with rupee proceeds of inward remittances received under this scheme, meant specially to support country's defence efforts. These accounts cannot be opened now. Effective from 2.4.1979, all such accounts have been redesignated as NRO accounts and provisions of NRO accounts govern them.

Non Resident Indians can maintain foreign currency accounts under the 'Foreign Currency(Non Resident) Account'(FCNR) scheme. FCNR accounts can be maintained in four currencies - Pound Sterling, US Dollar, Deutsche Mark and Japanese Yen. These accounts cannot be maintained in the form of savings/current accounts. They can be maintained only in the form of term deposits i.e. a deposit kept for a fixed

period of time which is subject to withdrawal or repayment after notice. Interest is payable only when they are for a minimum period of six months. The maximum period of maturity is 3 years for FCNR accounts. Premature withdrawal of the FCNR deposit is allowed with interest rate payable for the period for which the deposit had actually been. Uptil 1985, these deposits could be held for a maximum period of 5 years.

The rates of interest for FCNR accounts are based on the rates prevailing in international markets for the currencies concerned for deposits of comparable maturities and are always higher than that. This works as a security as well as incentive. Reserve Bank of India fixes this rate from time to time depending upon the changes taking place in international markets. However, the deposits continue to earn the contracted rates till maturity. This guarantees that the minimum return cannot be less than that from international markets. Funds in FCNR accounts are freely repatriable abroad through authorised dealers maintaining these accounts.

Debits to FCNR accounts for local payments are allowed freely. Investments can also be made through FCNR/NRE/NRO accounts. Prior permission for sale of government securities/units is not required. Sale/maturity proceeds can be repatriated if such securities were bought out of funds remitted from abroad or out of NRE/FCNR accounts.

There is one more scheme, Foreign Currency (Ordinary-Non-Repatriable) Deposit Scheme, under which NRIs can maintain deposits in the US dollar for a period of 6 months to 3 years. Earlier it was for a fixed period of 3 years. Banks have also been given the freedom to determine the interest rates as against the rate of 2 percent above the rate applicable to FCNR deposits for 3 yrs, as was the case earlier. As the name suggests, the principal amount and interest accrued are not repatriable.

Remittances made from credit to rupee accounts (NRE/NRO) maintained by NRIs are converted at market rate. Similarly, funds in FCNR accounts, if converted into rupee, are done at market rate, i.e. the rate as determined by authorised dealers on the basis of market forces as against the official rate determined by Reserve Bank. Income from interest on money standing to the credit of accounts other than NRO account is exempt from income tax. Gifts from such accounts are also free from gift tax. They are

also exempted from wealth tax.

In the wake of external finance crisis, Reserve Bank of India introduced a new scheme in November 1990 similar to FCNR scheme to mobilize foreign funds. This scheme was called the Foreign Currency (Banks and Others) Deposit [FC(B&O)D] scheme. It was also open to foreign citizens and banks and other institutions, but withdrawals were not allowed before maturity as in the case of other accounts. As foreign reserves mounted, this scheme was suspended from end July 1992.

In the second half of 1991-92, two additional schemes were introduced to attract forein exchange resources from Non Resident Indians. The State Bank of India launched its India Development Bonds for NRI including overseas corporate bodies. The bonds have a five year maturity period and are denominated in US dollars and Pound Sterling carrying high interest rates compared to prevailing international market rate. They are also free from income, wealth and gift taxes and are freely transferable among NRIs. The second schme was entitled "The Remittances in Foreign Exchange (Immunities) Scheme 1991". Under this the source of funds, purpose and the nature of remittance would not be subject to any scrutiny under the exchange control regulations and direct tax laws. However, any income received by the person on the remitted amount would be subject to income tax.

As far as remittances are concerned, India has no policy to sustain or increase inflows. There are no obligations for migrant workers or their foreign employees to remit any part of their earnings to India. In some other labour exporting countries of Asia, various incentives like a premium on the exchange rate or the use of a portion of remittance for imports exist. But in India no such incentives are given which makes it clear that the government never treated the outmigration of either HSM or skilled and unskilled workers as equivalent to exports. The only regulation concerning remittances as stipulated by foreign exchange control regime is that they should be channelled through official banking system and that balances held abroad by migrants should be repatriated if and when they return permanently with those funds, returning Indians can open Resident Foreign Currency Accounts(RFC) with banks in India. The entire amount of pension received from abroad can be credited to RFC account, which can be maintained in any

convertible currency. Funds in RFC accounts can be remitted abroad for any bonafide purpose of the account holder or his dependents other than for investment or purchase of immovable property abroad.[36]

The features of the external accounts as discussed earlier, shows that there are many incentives and benefits available to them including higher rate of interest compared to domestic deposits, repatriable nature of both principal and interest, loans and overdraft facilities both in India and abroad etc. NRE and FCNR accounts enjoy all advantages - safety, liquidity, repatriability and high returns. FCNR also covers the exchange risk whereas NRE does not. Also, there is no upper limit for these accounts. One remarkable point is that FCNR accounts which are insured against exchange risks can be maintained only in term deposits which fetch higher rates of interest whereas NRE accounts which carry the risk of exchange rate fluctuations can be maintained even on current or savings account. The newer schemes like FC(B&O)D scheme and India Developments Bonds also offered very high rate of interest, though the liquidity was not as high as in these older schemes.

The 1993-94 budget introduced the unified exchange rate in the sense that now foreign exchange earners, including Indian workers abroad sending remittances back home, would be able to convert 100% of their earnings at the market rate. Earlier they could convert only 40% of their earnings at market rate and remaining 60% at official exchange rate. This measure has removed the implicit tax on those who were sending remittances as well as other foreign exchange earners i.e. exporters, as there generally existed a difference of 25% between market and official exchange rate, the later being lower. This has been described by the government as making the rupee full convertible on trade account. However, in fact, it is

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36. The scheme of RFC is a new one (introduce in 1992) which has replaced the RIFEES (Returning Indians, Foreign Exchange Entitlement Scheme). Under RIFEES, the returning migrant could claim only upto 25% of repatriated sum for a period of 5 years either for specialised used if the person continues to live in India or for repatriation if the person decided to migrate once again. In the budget of 1987-88, it was raised to 50 percent and for a period of 10 years, and in 1992 was replaced by more liberal scheme of RFC

not rupee that has been fully converitble rather than foreign currency, in practice mainly US dollars, that has been made fully convertible and hence to call it full convertibility of rupee is misguiding.

To really examine the policy relating international financial inflow, it is necessary to consider the policies influencing investments from NRI, both directly and indirectly. The next section reviews the policies that govern investments by the NRIs.

6.3 INDUSTRIAL AND INVESTMENT POLICIES RELEVANT FOR NRIS:

The Government of India has a liberal policy for the promotion of investment by Non Resident Indians and offers many facilities to NRIs and overseas corporate bodies with at least 60% NRI holding, to invest in India. Though some incentives have already existed, the last few years have witnessed many changes in existing laws and industrial policy making them more liberal. Various schemes have been introduced providing wide range of facilities and incentives for both direct and portfolio investment.

The Industrial Policy 1991 and NRI Investment Policy 1991, simplified the approval procedure and raised the limits of NRI investments from 74% to 100% in industrial ventures in India. Facilities exist for direct investment in India with both repatriation benefits and without repatriation benefits. Investment upto 100% equity with full benefits of repatriation of capital invested and income accruing thereon, can be made in several cases: (i) High Priority Industries(ii) Establishing Export Houses; (iii) Hotels and Tourism related industries; (iv) Sick Industries; and (v) Hospitals, Advanced Diagnostic Centres, Shipping, Oil exploration service etc. All these are subject to certain regulations.[37]

NRIs are also allowed to invest in new issues of new and existing companies - raising capital through public issue with prospectus, upto 40% of the New Capital Issue, with full benefits of repatriation, provided it is a manufacturing activity. Dividends and Interests can be remitted freely to NRI

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37. Details of regulation for high priority industries can be seen in Annexure III of Industrial Policy Statement, 1991 dated 24th of July 1991 of the Government of India. Various Appendices supply the required information.

investors, subject to certain regulations which vary for different schemes

Reserve Bank has granted general permission to non resident individuals of Indian nationality/origin to invest by way of capital contribution in any propreitory or partnership concern in India on non repatriation basis provided the investee concerne is not engaged in any agricultural/plantation activity. Previously real estate business was also included in prohibited list but it has been deleted. This facility is however, not available to Overseas Corporate Bodies (OCBs). Reserve Bank permits NRIs including OCBs on application in prescribed form to purchase shares/debentures of existing Indian companies on non-repatriation basis.

NRIs are freely permitted to invest their funds in Government securities including National Savings Certificate or Units of UTI either through authorised dealer or UTI. They are freely transferable and sale/maturity proceeds are allowed to be remitted outside if they were bought initially out of funds remitted from abroad or out of NRE/FCNR accounts.

Under the Portfolio Investment Scheme, NRIs are permitted to acquire shares (both equity and preferential)/ Debentures (both convertible and non-convertible) of Indian companies through the stock exchanges in India. There is an overall ceiling of 5% of paid up value of each series of convertible debentures for purchase by NRIs/OCBs The overall ceiling can be raised to 34% if the company concerned passed a resolution to that effect in the General Body Meeting. Individually, NRIs including OCBs can make investment upto 1% of the paid-up share capital per series of convertible debentures. There is a lock-in period of one year for investment made on repatriation basis while there is none for investments made on non-repatriation basis.

NRIs are also permitted to keep deposits with public limited companies in India for a minimum period of three years subject to ceilings prescribed under the Companies (Acceptance of Deposits) Rule 1975. Reserve Bank has also granted general permission to Indian companies to issue Commercial Paper (CP)

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38. See RBI guidelines and Government of India Statements for details of these regulations.

to NRI individuals subject to conditions that the amount invested will not be repatriated outside India and the CP will not be transferred.

Apart from directly relevant policies and provisions, general industrial climate and regulations are also important from the point of view of NRI investment. Liberalisation of the economy at various fronts making it more open to the foreign investors has been one of the salient features of recent economic decisions. The 1991 industrial policy dereserved many industries and opened them to private investment. The system of industrial licensing which had virtually controlled the Indian industries till early 80s was minimised limiting it to security and strategy concerns, environmental issues, safety concerns and manufacture of product of a hazardous nature. Licensing, except in above mentioned cases, has been done away with in respect of both product and level of investment. Procedures for approval of investment and transfer of technology have also been simplified. All these are significant for making investment more attractive for NRIs as these made the process of investment simpler and easier.

The Import Licensing System was also liberalised to a great extent with adoption of New Industrial Policy 1991 and certain subsequent measures taken since then. The system of "eximscrips" was introduced in 1991 which were essentially tradeble import licenses issued to exporters for 30% of the value of exports. In March, 1992, the system of eximscrips was abolished and was replaced by LERMS (Liberalised Exchange Rate Management System) under which virtually all capital goods and raw matrials and components were made freely importable subject to tariff protection as long as the foreign exchange to pay for these imports was obtained from the market. Liberalised system of import of capital goods generally works as an incentive to investment in the economy especially fo foreign investors.

A number of measurs were taken in 1991 Industrial Policy to attract foreign investment. Under this policy, approvals for direct foreign investment upt 51% of equity in specified high priority industries were to be given automatically subject to the condition that the dividend payment should be balanced by export earnings over a specified period of time. This condition of dividend balancing was withdrawn in 1992 in respect of all foreign investment approvals except for some notified consumer goods industires. Along with liberal provision of approval and raising the equity limit to 51% for financial collaboration,

foreign technology agreements were also given liberal provisions. Within certain guidelines, firms would get automatic approval for technological collaboration for a specified list of high technology and high investment priority industries[39] Royalties are allowed upto 5% of domestic sales and 7% of export sales, along with lumpsum technology payments of upto Rs.1 Crore. This facility of automatic approval is available to other industries also if the payments can be made without resorting to foreign exchange resources. In an major departure from past policies, the royalty limits permissible is net of tax and not gross. Foreign investors, especially NRIs have been given wide range of facilities for starting joint ventures. Depending on the agreement, NRI collaborator may be given veto rights in many things.

Two amendments in January 1992 and January 1993 to Foreign Exchange Regulations Act (FERA), 1973 wer also in line with the new liberalised industrial, trade and exchange rate policies, trying to make it more attractive to foreign investment. As a result, FERA companies have been brought at par with Indian companies. Earlier, a FERA company meant a company with foreign share holding of more than 40%, which was raised to 51% in 1991. Several restrictions on foreign companies have been removed and joint ventures abroad by Indian Companies fully allowed. Restrictions on assets held in India by NRIs have been removed. RBI permission is not needed for transfer of shares, debentures or bonds of Indian companies to NRIs.

Income derived by foreign companies as dividend, interest, royalty or technical fees is now taxed at a rate lower than that applicable to domestic companies. While the rate of tax for domestic companies is 45%, in the case of foreign companies, the rates are 25% for dividend income and interest and 30% for royalty and fees for technical services. The rates applicable to foreign companies may be less where agreements for the avoidence of double taxation exist. In the case of NRIs, the rate of tax is 20% on income arising from investment in shares in an Indian company or debentures issued by a non private Indian company. NRIs, thus, along with various other incentives, have also this benefit of lower rate of taxation.

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39. For a list of high priority industires see Annexure III of Industries list by Government of India.

The above descriptions outline the changes which were introduced in last three to four years in industrial and investment policy relating mainly to NRIs. With more opening up of economy and abolition of various regulations, the special benefits and incentives meant for attracting NRI investments have been much widened. Dereservation, de-licensing, liberalisation of FERA and exchange rate policies, simpler terms and higher limits for collaborations, all these have significant relevance for any foreign investor. NRIs are certainly one target which Indian Government seems to be wooing for investment in economy with special schemes and tax benefits.

The above description regarding polices related to financial inflow through Indian emigrants suggest that policy intervention is considerable in terms of incentives provided to repatriable deposits and financial investments. In case of remittances, policy intervention is negligible and no guiding or regulatory policy exists either to increase their flow or to direct their use, except the mandatory rule of use of banking channel. On the contrary a number of schemes exist both to encourage the level of inflow as well as to regulate the direction of flow in case of investment, maninly in the form of various incentives and beneifts. The emphasis of the policy is on permanent migrants settled abroad who are earning quite well and are looking for avenues to invest. This obviously means highly qualified migrants who are settled permanently in developed countries. The policy, of course, views them as an important source of financial inflow in general and forein exchange supply in particular. The guiding force behind this policy seems to be of tapping this resource through incentives. There is no element of any compulsion at any point in this policy regime even to earn this financial resource. As such, the whole analysis suggests that the country does not have a comprehensive set of policies to link the losses associated with emigration of highly qualified manpower, with the financial inflows orginating through them.

6.4 TRENDS IN FINANCIAL FLOWS : MACRO LEVEL EVIDENCES

Till now, we have discussed the policy regime which govern the financial flows from Indian emigrants in various forms. In this section, we would analyse the trends as discernible in three types of flows at macro level : (i) remittances, (ii)repatriable bank deposits, and (iii)private foreign investment. With

the help of this analysis it would be possible to make a comment on the question that how the Indian emigrants have contributed the financial needs of the country.

6.4.1 **REMITTANCES:** Though India has always been receiving some amount of remittances, its importance was suddenly realised in second half of 1970s when its share in 'invisibles' in the current account balance in Balance of Payment Statistics suddenly rose. In balance of payments statistics, credits on account of private transfer payments can be identified as indicative of remittances. Though this amount also includes grants, but that constitutes a small percentage and hence these can be taken as indicative of trends in remittances flow.

TABLE 6.1

CREDITS INTO PRIVATE TRANSFER PAYMENTS IN INDIA'S BALANCE OF PAYMENTS

YEAR	In Rs. Million	In US $ Million	In SDR Million
1970-71	1364	-	-
1971-72	1745	-	-
1972-73	1653	134	122
1973-74	2033	182	150
1974-75	2799	277	228
1975-76	5412	490	409
1976-77	7457	698	603
1977-78	10293	1071	903
1978-79	10592	1151	905
1979-80	16320	1817	1397
1980-81	22687	2692	2093
1981-82	22370	2322	2015
1982-83	25410	2514	2301
1983-84	27850	2561	2421
1984-85	31162	2508	2499
1985-86	28354	2219	2101
1986-87	29906	2340	1936
1987-88	35327	2725	2063
1988-89	38654	2669	2007
1989-90	38239	2297	1790
1990-91	36260	2021	1459

Source : Reserve Bank of India, Report on Currency and Finance Annual Issues for Rupee value and Deepak Nayyar.(1994) for US dollar and SDR values.

Table 6.1 shows these entries for a period of twenty-one years as supplied by Reserve Bank. It can be seen that these payments grew tremendously in mid 1970s. Beginning from 1981-82, three short periods of stagnation during early 1980s, mid 1980s and late 1980s, can be noticed. In between phases of recovery and growth in these flows kept coming. However, the above trend is in respect of rupee at current exchange rate. Since rupee has been subject to change from fixed exchange rates to floating exchange rates and from that to partial and full convertibility, it is better to see these trends also in terms of major international media of exchange i.e. US dollar and SDR. It can be seen that even in dollar terms, the remittances registered a sharp growth during 1970s, especially later part of it. After 1980-81, a trend of decline and stagnation is noticed except once during 1987-88. This trend of decline is more visible in SDR value of these transfer payments. The reason for this, other than real stagnation or fall in remittances, is sharp appreciation of both dollar and SDR in terms of rupee during the period.

TABLE 6.2

CREDITS INTO PRIVATE TRANSFER PAYMENTS IN INDIA'S BALANCE OF PAYMENTS: REGION WISE

(in Rs. million)

YEAR	STERLING AREA	DOLLAR AREA	OECD Countries	Rest of Non-Sterling Area	Total
1970-71	372	843	114	35	1364
1971-72	579	939	194	33	1745
1972-73	459	1003	159	32	1653
1973-74	736	1041	189	67	2033
1974-75	1107	1267	349	76	2799
1975-76	2481	2280	502	149	5412
1976-77	3542	2871	664	380	7457
1977-78	6157	2502	786	848	10293
1978-79	6075	2720	949	848	10592
1979-80	9783	3809	1192	1536	16320
1980-81	15286	3490	1684	2227	22687
1981-82	13168	4896	1866	2440	22370
1982-83	14961	4465	1828	4149	25403
1983-84	14757	5239	2119	5735	27850
1984-85	15297	5932	2220	7713	31162
1985-86	14507	6002	2578	5266	28353
1986-87	16539	5323	2617	5427	29906
1987-88	16830	6245	3705	8547	35327
1988-89	14563	12955	3943	7193	38654
1989-90	15696	7998	5434	9111	38239
1990-91	16899	8645	4633	6083	36260

Source : Reserve Bank of India, Report on Currency and Finance Annual Issues.

Remittances originate from all types of migration - skill and unskilled workers migrating to the middle east countries and highly advanced and trained professionals migrating mainly to developed countries - all remit money to India. The main aim here is to identify the remittances originating from HQM. It is not an easy task as there is no such data available. Since there is definite trend in destination of these two types of migration, it can be assumed that remittances coming from developed countries originate from HQM and from middle east countries come from comparatively less educated and uneducated migrants. Reserve Bank, however, does not provide even country wise data and only region wise data is available (Table 6.2). The whole world has been divided into four regions viz. Sterling Area, Dollar Area, OECD countries and Rest of Non Sterling Area. Deepak Nayyar has estimated the composition of remittances to India by origin on the basis of certain assumptions.[40] These assumptions seem to be reasonable to the

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40. Deepak Nayyar: Migration, Remittances and Capital Flows: The Indian Experience; Oxford University Press, Delhi, 1984.

These assumptions are as follows:

(a) The dollar area comprises the USA, Canada, the Central American countries and a few countries in Latin America. It is assumed that private transfer payments originate in the USA and Canada. Contra-entries for imports under the PL-480 programme, which are included in the credits on account of the private transfer payments are adjusted to reach the amount of remittance estimated to be originating in North America.

(b) The region of the OECD area in India's balance of payments statistics is contributed by the countries of Western Europe, excluding the UK and including Turkey. Hence, private transfer payments from this region are entirely assumed to be attributable to remittances from Western Europe.

(c) The Sterling Area, as defined in India's balance of payments statistics, includes the UK and Ireland, the Caribbean islands, some countries in East and West Africa (such as Kenya, Tanzania, Zambia and Nigeria), the Persian Gulf states in the Middle East (Bahrain, Kuwait, Oman, Qatar and United Arab Emirates), South Asia (Pakistan, Bangladesh and Sri Lanka), parts of South East Asia (including Hong Kong, Malaysia and Singapore), Australia, Newzeland and Fizi. Given the diverse range of countries, the de-composition of private transfer payments from this area was a complex problem. On the basis of migration trends and certain other features of the period, Nayyar has reached certain assumptions. It is assumed that the share of the UK and Australia in private transfer payments from this area was 60% until 1973-74, 40% in 1974-75 and 25% in 1975-76, whereas the corresponding

extent that they consider actual population of Indian nationality origin residing in different regions and try to relate them. At the same time, there are certain elements of arbitrariness in these assumptions, i.e., assuming the change in any country's share to be discrete and not continuous. However, due to non-availability of actual data and also due to fair amount of reasonability in these assumptions[41] these estimates are the best possible way to have certain kind of indicative trends.

...Continued...

share of the Persian Gulf States was 10%, 20% and 50% respectively; the remaining share of 30%, 40% and 25% respectively was attributable to the East African and South East Asian countries in the Sterling Area. For the period 1976-77 to 1990-91, it is assumed that the share of the Persian Gulf states in private transfer payments from this area was two thirds. The remaining one third was divided into equal parts between UK and Australia on the one hand and the developing countries in East Africa and South Asia on the other, for the period 1976-77 to 1984-85 and in the proportion of one-third and two-third during the period 1985-86 to 1990-91.

(d) The regime described as the rest of the non-Sterling Area comprises the remaining countries of the world, including the formerly Socialist countries of Eastern Europe, most of Latin America, a very large part of Africa and the Asian countries outside the Sterling Area. A significant number of the oil exporting countries in West Asia and North Africa, in particular Saudi Arabia, Iran, Iraq and Libya, are part of this region. It is assumed that no remittances are recived from Latin America and Eastern European countries and hence entire amount of remittances are attributed to developing countries of Asia and Africa. In view of the fact that these receipts were negligible until the mid 1970s, but increased at a phenomenal pace thereafter, it is assumed that the share of the oil exporting countries of West Asia and North Africa in private transfer payments was negligible until 1973-74, 50% in 1974-75 and 1975-76 and 90% during the period from 1976-77 to 1984-85. In view of the decline in labour outflows to, and a contraction of economic activity in Iran, Iraq and Libya, it is assumed that this share was lower at 80% in the period 1985-86 to 1990-91.

41. Nayyar also claims to have consulted the concerned RBI officials and then have reached these assumptions.

Table 6.3

ESTIMATED COMPOSITION OF REMITTANCES TO INDIA BY ORIGIN

(in Rs. million)

YEAR	NORTH AMERICA	WESTERN EUROPE	BRITAIN & AUSTRALIA	MIDDLE EAST OIL EXPORTING COUNTRIES	OTHER DEVELOPING COUNTRIES	TOTAL REMITTANCES
1970-71	284	114	223	37	147	805
1971-72	312	194	347	58	207	1118
1972-73	391	159	275	46	170	1041
1973-74	432	189	442	74	287	1424
1974-75	670	349	443	259	481	2202
1975-76	1105	502	620	1316	694	4237
1976-77	1651	664	590	2704	628	6237
1977-78	1382	786	1026	4868	1111	9173
1978-79	1566	949	1013	4813	1097	9438
1979-80	2210	1192	1631	7904	1784	14721
1980-81	2100	1684	2548	12194	2771	21297
1981-82	3355	1866	2195	10975	2438	20829
1982-83	3363	1828	2494	13700	2915	24300
1983-84	3871	2119	2460	15000	3033	26483
1984-85	4589	2220	2550	17140	3320	29819
1985-86	4803	2578	3224	13884	2665	27154
1986-87	5323	2617	3675	15368	2923	29906
1987-88	6245	3705	3740	18058	3579	35327
1988-89	12955	3943	3236	15463	3057	38654
1989-90	7998	5434	3488	17753	3566	38239
1990-91	8645	4633	4844	14499	3639	36260

Source : Reserve Bank of India, Report on Currency and Finance, Annual Issues, as estimated by Nayyar(1994).

Note : The method of estimation and the underlying assumptions are mentioned in footnote 40 of the text.

Table 6.3 which is based on those estimates reveals that beginning in the mid-1970s, there was a rapid growth in remittances from all the countries. The growth was most spectacular for the oil exporting middle east countries for the period of second half of 1970s. During the period 1980-81 and 1983-84, shares of all the countries stagnated. Among the industrialized countries, the share of North America has been around 45-50% except in 1988-89 when it went upto Rs.12995 billion-almost two third of the total amount supplied by industrialized world. The composition of remittances to India, by origin, witnessed a change during the 1980s, as pointed by Nayyar(1994):

> During the period 1980-81 to 1984-85, remittances from oil exporting countries of the middle east were at their peak level and contributed almost 57% of total remittances, whereas remittances from industrialized countries contributed 32%. In the second half of the 1980s, from 1985-86 to 1989-90, the share of the middle east countries fell to 47% while that of the industrialised countries rose to 43%. Remittances originating from non oil exporting developing countries accounted for about 10% of remittances over the period.(Ref. Nayyar(1994); pg.50).

On the whole, if it is assumed that at least half of the remittances originating from other non-oil exporting countries come from HQM and a small proportion of remittances coming from middle east countries also originate from highly educated professionals[42], it can be safely concluded that around 50% of total remittances come from emigrating HQM, the remaining 50% coming from migrating workers, both skilled and unskilled, mainly from the all exporting Middle East countries. But, here what is to be remembered is that the size of migrant population from India in industrialised countries is much greater compared to size of migrant Indians in the Middle East countries. As such, the remittances per migrant seems to be lower for industrialised countries.[43] However, the share of industrialised countries has increased over the years, as outlined above and the absolute amount from these countries also increased substantially during the period of late 1970s. Certain facators acting at international level like change in effective exchange rate and rise in price of gold in international market as well some government

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42. The other developing countries included Kenya, Tanzania, Malaysia, Singapore, Hong Kong and Nigeria. At the beginning of 1980s, 100,000 persons of Indian origin lived in Kenya, 50,000 in Tanzania, 120,000 in Malaysia, 170,000 in Singapore and 15,000 in Hong Kong (Jain 1982, p.303) Majority of these migrants were highly qualified personnel. The estimated Indian population in Nigeria was 40,000, constituted mostly by persons with professional or technical expertise (Nayyar 1989, p.105). Even in the Middle East countries, a small proportion of migrants were highly qualified people, if advertisements in the Newspapers in all those years are any indicators.

43. According to Nayyar(19*3 in 1980-81, remittances per capita were Rs.3415 for North America, Rs.10,024 for Western Europe, Rs.3,417 for Britain and Australia and Rs.20,155 from the Middle East. These figures have been arrived at by taking estimates of the migrant population in different countries and estimates of remittances together.

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policies were responsible for this growth to some extent. Though there is no concrete evidence to corroborate, but it is probable that increased migration of HQM to United States after 1965 had matured by that time and migrant Indians had established themselves in the US economy were earning enough to send substantial amount of remittances. Among the industrialised countries, the remittances coming from North America which incudes the US and Canada, has risen by highest amount during the period(Table 6.3).

Utilisation of remittances by receiving households as between consumption, savings or investment is very important in order to analyse its impact on economy. Unfortunately, there is no macro level evidence available in this regard. Certian micro level studies are available mainly in context of Kerala

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which is the largest supplier of labour from India to the Middle East. These studies mainly reveal that major portion of remittances are spent on construction of buildings and purchase of land, ornaments and consumer durables. The work participation rate of in the emigrant households is reportedly less than that in contol households (Keral Government Report, 1987). However, since our main object of study is HQM, and not skilled or unskilled labour, it is not wholly justifiable to generalise on the basis of study which is entirely based on sample of that kind of labour. The socio-economic background of two types of manpower differ widely and hence the behaviour pattern also might differ as far as use of remittances is concerned.

6.4.2 Bank Deposits: Among the various types of accounts which can be held by Non Resident Indians, two are most important from the point of view of analysing the flow of financial resources through migrating Indians, originating from their countries of destination. They are Non Resident(External) Rupee Accounts (NRE Accounts) and Foreign Currency (Non Resident) Accounts (FCNR). They are repatriable deposits

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44. See Nayyar(1989) pg. 1+3109 for detailed analysis.

45. See report of the Survey on the utilisation of Gulf remittances in Kerala. Department of Economics and Statistics. Trivandrum, December 1987; Government of Kerala and P R Gopinathan Nair; "India" in Godfrey Gunatilleke (ed), Migration of Asian Workers to the Arab World, Tokyo: The United Nationls University; 1986.

and enter into the capital account on the balance of payments. Table 6.4 outlines the outstanding amount of the end year as well as annual inflows in these accounts for the period 1975-76 to 1992-93 in rupee terms. There has been continuous increase in total deposits during the period. This growth, however, has been most spectacular during second half of 1980s. The inflows also registered a similar trend when they increased from around Rs.9 billion in 1984-85 to areound Rs.22 billion in 1989-90. The outstanding amount almost stagnated and net inflow come down to Rs.4 billion in 1990-91 and turned into a net outflow of Rs.37 billion in 1991-92. In the following year, i.e. 1992-93 net inflow again become positive, and total outstanding deposits also increased to Rs.256 billion.[46]

The relative share of the two deposits also underwent a change both in amount outstanding and in annual inflows during the period, as recognised in the following passage:

> Until the early 1980s, net capital inflows were confined largely to the non resident external rupee accounts, whereas the net capital inflows into the foreign currency Non Resident accounts were small and in some cases even negative. Beginning in 1982-83, however, there was a rapid change in the composition of these capital inflows,. The share of FCNR accounts in total inflows rose from a negligible level in 1981-82 to an average level of 36.3% during the period 1982-83 to 1984-85 and an average level of 81.8% during the period 1985-86 to 1989-90. It is worth noting that the composition of the stocks of deposits, in terms of currency denomination did not change in as dramatic a manner as the composition of the flows. Until 1984-85, more than 75% of the total amount outstanding in external accounts were denominated in reupees; thereafter this proportion declined rapidly and fell to a level below 40% by 1989-90. (Nayyar, 1994).

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46. It is necessary to point out that the difference between the amounts outstanding at the end of a financial year and the end of the preceding financial year does not provide a measure of the net inflows during the year. In the case of NRE accounts, the data on amounts outstanding include accrued interest so that the increase is attributable in part to the interest due and only in part to the net inflows. The data on amount outstanding in FCNR accounts do not include accrued interest but, the increase may be partly attributable to the depreciation in the exchange value of the rupee vis-a-vis the currency of denomination and only in part to net inflows. As such, the data on amount outstanding would overstate the net inflows. However, the figures in the table 6.4 for both categories, are separately compiled and estimated by the RBI (Nayyar 1993).

TABLE 6.4

EXTERNAL ACCOUNTS MAINTAINED IN INDIA BY NON-RESIDENT INDIANS: DEPOSITS AND INFLOWS

(In Rs. Million)

YEAR	AMOUNTS OUTSTANDING AT THE END OF THE YEAR(31st March)			INFLOWS DURING THE YEAR (NET)		
	Non-Resident External Rupee Accounts (a)	Foreign Currency Non-Resident Accounts (b)	Total Deposits (a)+(b)	Non-Resident External Rupee Accounts (c)	Foreign Currency Non-Resident Accounts (d)	Total Inflows (c)+(d)
1975-76	639	75	714	294	75	369
1976-77	1894	570	2464	1165	495	1660
1977-78	3247	1424	4671	1170	854	2024
1978-79	4919	1568	6487	1398	144	1542
1979-80	7009	1538	8547	1658	-30	1628
1980-81	9377	1523	10900	1820	-40	1780
1981-82	12590	1467	14057	2220	-160	2060
1982-83	16792	2514	19306	2740	1090	3830
1983-84	22543	6148	28691	3780	3310	7090
1984-85	28640	9550	38190	6040	2750	8790
1985-86	34610	21890	56500	6160	11510	17670
1986-87	43362	35110	78472	4770	11730	16500
1987-88	51070	49470	100540	4770	13630	18400
1988-89	58990	82550	141540	2350	22300	24650
1989-90	65070	113240	178310	-40	21790	21750
1990-91	73490	134050	207540	1560	2550	4110
1991-92	80710	136080	216790	-440	-36410	-36850
1992-93	90620	165720	256340	1110	2230	3340

Sources :
For the period 1984-85 to 1991-92, Reserve Bank of India, Annual Reports 1988-89 onwards. For the period 1980-81 to 1983-84, for data on amounts outstanding at the end of the year, Ministry of Finance, Economic Survey, 1986-87, and for data on inflows, unpublished Reserve Bank of india estimates. For the period 1975-76 to 1979-80 the data on amounts outstanding compiled by Reserve Bank of India, as also the data on inflows estimated by Reserve Bank of India, are unpublished. (As given in Nayyar(1994).

Notes : (a) The figures for the amounts outstanding in the non-resident external rupee accounts include accrued interest.

(b) The figures for the amounts outstanding in the foreign currency non-resident accounts do not include accrued interest.

(c) The figures in inflows do not include accrued interest in either category.

The composition of deposits in terms of stocks did not change in any significant manner thereafter. In the composition of flows, however, the share of NRE accounts again rose to somewhere between 30 and 40 percent in 1990-91 and 1992-93. In 1991-92, where net inflows were negative, the share of NRE account to outflows was meagre at 1.2% reflecting high sensitivity of FCNR accounts.

The data on external accounts in rupee terms have obvious limitations[47] However, for FCNR accounts, the data are available for both stocks and flows in the currencies in which the accounts are denominated (Table 6.5). In dollar denominated accounts the trends are similar to those of total deposits in rupee terms - a pehnomenal growth during second half of 1980s. The outstanding deposits started rising at a fast pace in 1982-83 only but from 1985-86 the increase was really spectacular as the net annual inflow averaged almost 1 billion per annum between 1984-85 and 1989-90. The net inflow, however, dropped to $345 million in 1990-91 and turned into net outflow of $1.8 billion in 1991-92. This net outflow continued but fell to $742 million in 1992-93. The amounts in Pound Sterling denomination also registered a high growth for two years beginning in 1983-84, but stagnated thereafter for the rest of 1980s. The net inflow was negative and in 1991-92 it turned into net positive inflow at £356 million. In the following year, though the net inflow fell, the figure (£ 307 million) remains very large. The accounts in Duetsche Mark and Japanese Yen were started much later. The trends are similar to that of US dollars account upto 1991-92 in both of these. In 1992-93, though the Duetsche Mark accounts experienced a net outflow as was

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47. Nayyar (1994) pointed out to these limitations. The data on the rupee value of deposits in external accounts are not quite appropriate for an analysis of trends either in stocks or in flows, for two reasons. First, the steady depreciation in the exchange rate of the rupee during the period under review is implicit in the data, so that the observed increase is attributable, at least in part, to this depreciation. Second, even the estimated rupee value of net inflows, which is different from the increase in the stock of deposits between the end of one year and the reast, it is not appropriate because of a problem associated with the valuation of inflows and outflows. For any repatriable deposit received in year 't', for a period of say three years, both the inflow in year 't' and the outflow in year 't+3' are valued at the same exchange rate prevalent at the time that the deposit is made in year 't', but inflows in year 't+3'. Thus the Reserve Bank of India estimates of the net inflows into FCNR account over-state the magnitude of the net inflows in terms of foreign exchange value.

the case of US dollar accounts, Japanes Yen accounts experienced a massive inflow of Y 47 billion.

TABLE 6.5

FOREIGN CURRENCY NON-RESIDENT ACCOUNTS IN INDIA: STOCKS AND FLOWS

YEAR	Outstanding Deposits at the end of the year		Estimated Inflows during the year	
	US Dollar Accounts (in $ million)	Pound Sterling Accounts (in - million)	US Dollar Accounts (in $ million)	Pound Sterling Accounts (in - million)
1980-81	140	20		
1981-82	107	28	-33	8
1982-83	152	68	45	40
1983-84	374	136	222	68
1984-85	499	218	125	82
1985-86	1419	236	920	18
1986-87	2360	224	941	-12
1987-88	3410	222	1050	-2
1988-89	4245	203	835	-19
1989-90	5409	119	1164	-84
1990-91	5754	89	345	-30
1991-92	3978	445	-1776	356
1992-93	3236	752	-742	307

	Deutsche Mark Accounts (in DM Million)	Japanese Yen Accounts (in Y Million)	Deutsche Mark Accounts (in DM Million)	Japanese Yen Accounts (in Y Million)
1988-89	848	31571	848	31571
1989-90	1013	60327	165	28756
1990-91	874	59403	-139	-924
1991-92	284	44028	-590	-15375
1992-93	222	91020	-62	46992

Source : For the period 1980-81 to 1983-84, Ministry of Finance, Economic Survey, 1986-87. For the period 1984-85 to 1991-92, Reserve Bank of India, Annual Reports, 1988-89 onwards.

Notes : (a) The inflows during each year are estimated as the difference between the amounts outstanding, for each category of external account, on the last day of the financial year 31 March, and the last day of the preceding financial year; as data for earlier years, in the 1970s, are not available, it is not possible to estimate the inflows during 1980-81 or earlier. (b) From their inception in 1975, foreign-currency non-resident accounts could be denominated either in US Dollars or in Pound Sterling. The facility was extended, beginning 1 August 1988, to accounts denominated in Deutsche Mark or Japanese Yen.

TABLE 6.6

DEPOSITS AND FLOWS IN INDIA'S "FOREIGN CURRENCY(BOND & OTHERS) DEPOSITS" AND TOTAL NRI DEPOSITS (1990-91 TO1992-93)

(In Rs. million)

YEAR	Foreign Currency (Bonds & Others) Deposits		Total External Deposits (Repatriable)	Total Inflows
	Deposits*	Net Inflows#	(NRE+FCNR+ FC(B&O)D)	(NRE+FCNR+ FC(B&O)D)
1990-91	5150	4850	212690	8960
1991-92	15710	7420	232500	-24430
1992-93(P)	32610	8810	288950	12150

Notes : P = Provisional
* includes accrued interest
\# actual inflow/outflow

Source : Reserve Bank of India, Annual Report, 1992-93 and Table 6.4.

Before proceeding further, data on one more type of account, i.e. Foreigh currency (Bonds & others) Deposits, should also be considered, so as to have exact idea on total deposits outstanding and inflows, though the scheme was in operation for a brief period of two and half years between 1990 and 1993. The outstanding deposits increase from Rs.5.15 billion in 1990-91 to Rs.52.1 billion in 1992-93 (Table 6.6). In 1992-93 the net inflow was around Rs.9 billion, almost four times higher than FCNR net inflows and eight times higher than net inflow in NRE accounts. It is obvious that the scheme attracted massive inflows during its brief period of operation. But the scheme was not limited to Non Resident Indians only and included foreign nationals. However, India has not been an excellent country from the point of view of attracting foreign investment due to general lack of developed capital market. Besides, the country was in a volatile situation during the period. Hence it is quite reasonable to assume that significant portion came through NRIs some of which were probably transferred money from FCNR to this account due to higher returns. This, of course, is not possible to establish, as there is no evidence to support.

TABLE 6.7

TRENDS IN RATES ON INTEREST ON EXTERNAL ACCOUNTS AND TRENDS IN LIBOR(LONDON INTER-BANK OFFER RATE)

Rate of Interest	NRE (for 1 year or more but less than two yrs	FCNR (Deposits for 1 year or more but less than two years)		LIBOR	
		US Dollar	Pound Sterling	US Dollar (one year deposit)	Pound Sterling (6 months deposits)
1981-82	10.00	10.00	10.00	16.10	14.32
1982-83	10.00	10.00	10.00	12.00	12.58
1983-84	10.00	10.00	10.00	10.30	10.18
1984-85	10.00	10.00	10.00	11.60	10.02
1985-86	10.50	9.5-10.5	9.5-10.5	8.1-9.1	12.25
1986-87	10.50	8.0-8.5	8.0-8.5	6.2-7.2	10.97
1987-88	10.50	8.5-10.0	8.5-10.0	7.5-8.3	9.80
1988-89	10.50	9.0-11.0	11.75	8.1-10.3	10.36
1989-90	10.50	8.75-10.50	11.75	8.4-9.9	13.94
1990-91	10.50	8.0-9.50	11.75-13.25	7.0-8.8	14.79
1991-92	not exceeding 13 percent	5.75-8.0	8.0-12.0	6.29	11.67

Sources : For interest rates on external accounts in India: Reserve Bank of India, Report on Currency and Finance, annual issues, For the London Inter-Bank Offer Rate: IMF, International Financial Statistics, various issues.

Notes : (a) Interest rates on non-resident external rupee(NRER) accounts were stable and remained almost unchanged from 1981-82 to 1990-91. Interest rates on foreign-currency non-resident(FCNR) accounts were also stable and did not change during the period from 1981-82 to 1984-85. Beginning in 1985-86, however, interest rates on FCNR account were adjusted periodically, often several times in a financial year, in accordance with developments in international capital markets. Thus, figures in the bottom half of the table show the range of interest rates, rather than a single interest rate, in each fiscal year.

(b) Until, 1987-88, FCNR accounts could be denominated in US dollars or in Sterling and the interest rate was the same for both. Beginning, in 1988-89, FCNR deposits could also be denominated in Deutsche Marks or Japanese Yen. At the same time, the uniform interest rate was discontinued and different interest rates were introduced for each currency. However, the table shows the evidence only for US dollar and Pound Sterling.

(c) The financial year range for LIBOR is based on data for quarterly period averages.

(d) The rates for LIBOR are period averages in percent per annum for calendar year i.e. 1981-82 shows for Jan-Dec,1981.

(e) The rates of LIBOR for US dollar for period 1981-82 to 1984-85 are average for financial year (April to March) and for 1991-92 is average for calendar year 1991.

(f) The rates of interest for FCNR on Pound Sterling for period 1988-89 and 1989-90 are prevailing rates at the end of that financial year.

TABLE 6.8

EXCHANGE RATE OF INDIAN RUPEE VIS-A-VIS SELECTED CURRENCIES OF THE WORLD

(Rupee per unit of foreign currency)

YEAR	US Dollar	Pound Sterling	Deutsche Mark	Yen	SDR
1980-81	7908	18500	4188	0.037	10.178
1981-82	8968	17110	3861	0.039	10.335
1982-83	9666	16136	3960	0.039	10.563
1983-84	10340	15417	3940	0.044	10.941
1984-85	11889	14867	3988	0.049	11.933
1985-86	12235	16847	4555	0.056	12.923
1986-87	12778	19072	6297	0.08	15.447
1987-88	12966	22087	7400	0.094	17.121
1988-89	14482	25596	8049	0.113	19.262
1989-90	16649	26918	9092	0.117	21.368
1990-91	17943	33193	11435	0.128	24.849
1991-92	24474	42515	14625	0.185	33.433

Note : These rates are annual averages.

Source : Reserve Bank of India, as given in Economic Survey, (1992-93) Ministry of Finance, Government of India.

Table 6.7 shows trends in rates of interest for external accounts and also trends in London Inter Bank Offer Rate (LIBOR). Evidences in table 6.5 seen alongwith these trends make it obvious that flows in FCNR accounts were sensitive to the difference in rates of interest being offered. Large inflows in US dollar Account of FCNR during late 1980s is explained by this difference to a great extent. Interest rates were higher as compared to not only LIBOR but also to those prevailing in capital markets of most of the ndustrialised countries.[48] What is remarkable, however, is that inflows in NRE accounts remained positive until 1988-89, despite sharp depreciation of the rupee during the 1980s. In the first half of 1980s rupee depreciated continuously vis-a-vis dollar and Yen but appreciated against Pound Sterling and remained almost stable against Deutsch Mark. However, during the second half, the rupee depreci-

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48. For evidence, see Report on Currency and Finance, RBI (Annual Issues) and International Financial Statistics, IMF (Annual Issues).

ated vis-a-vis all the major currencies (Table 6.8). The trend in annual inflows into NRE accounts makes it obvious that they were responsive to exchange rate fluctuations as their account did not cover that risk. But, at the same what reamins unexplained is that despite sharp depreciation in the exchange value of rupee and low difference in interest rates, inflows in this account remained positive and kept increasing for quite a long period of time.

Both the types of accounts, however, seem to be most sensitive to international perceptions of credit-worthiness. Sharp fall in inflows and the huge net outflows experienced during 1990-91 and 1991-92. Despite interest rate differencials, large outflows from these accounts, especially from FCNR account (Table 6.5) during this period worsened the already bad balance of payments crisis. The economic crisis of the period was a consequence of several problems, as outlined in the following para:

> The mounting fiscal deficits and the large current account deficits through the second half of the 1980s, associated with a rapid accumulation of external debt, had already created a fragile balance of payments situation, that was unsustainable. The problems associated with these macro economic imbalances were exacerbated by the impact of the Gulf crisis and the ensuing war and its effects on the economy. This coincided with an uncertain situation in the polity during late 1990 and early 1991. Matters were made worse by a prolonged political interregum in the run up to the elections which were completed only in late June 1991. Taken together these developments led to an erosion of international confidience in India increasing doubts about its capacity to repay debt. Adverse international perceptions of the situation, combined with expectations, had a dramatic impact on repatriable deposits in external accounts (Nayyar (1994))

No evidence is available in any published form either Reserve Bank of India or Ministry of Finance regarding origin of these external accounts by country. Unlike remittances, even region wise data is not available. This makes the task of determining the source of origin difficult. However, the trends in the inflows suggest that investors not only possess high level of investible savings, they also have a high capacity to perceive and judge. This has led to the assumption, that these accounts originate from highly qualifed man power.

6.4.3 DIRECT FOREIGN INVESTMENT: Non-Resident Indians can interact with home country directly via Foreign Direct Investment (FDI), portfolio investment, exports or licencing of technolgy and patents. In this section we are analysing the trend in FDI through NRI, as discernible by available evidences. FDI may involve a financial flow in the form of equity capital or it may involve only a sale of technology.

What is important here is long term interest and controlling power different from short term considerations of speculative gain in portfolio investment. FDI through NRI usually take the shape of a collaboration as in the case with FDI through a foreign company or multi-national corporation except in cases of cent percent automatic approved scheme for NRIs. A colloboration can take the form of either a financial colloboration or a technical colloboration or both. A financial colloboration can take the form of equity inflows or loans. A technical colloboration is one where the foreign colloborators undertakes to sell technical designs and drawing on the basis of lumpsum fee, specified in the agreement. The Secretariat for Industrial Approvals under Ministry of Industry is the sanctioning authority in most cases. A special Board (Foreign Investment Promotion Board) was set up in 1991 to look into large foreign investment projects.

A colloboration in India has mainly been seen as a vehicle of technology transfer. The various policy statements made it explicit that colloboration would be encouraged only in thos areas where domestic technology was not available. As such, till the beginning of 1980s, the percentage of cases involving financial investments in total number of colloborations never exceeded 15% (Table 6.9). The total number of colloborations was also very low in the period. Both the total number and the percentage of financial colloboration started increasing in eighties, especially in the later part. In 1992, the total number of colloborations went up to as high as 1520, 48% of which involves financial investment. Unfortunately, the information regarding NRI colloboration is not available for 1970s and early 1980s. However, in the period 1988-92, for which the evidence is available, all the NRI colloborations involved financial participation (Table 6.10). As such, though their percentage in total colloborations was not very significant it was around 20% in financial colloboration except in 1990 and 1991 when it fell to 12 and 16.11 percent respectively.

The number of colloborations do not reveal much in itself. What is more significant is the amount being invested. The share of NRIs reached as high as 35.27 percent of total foreign direct investment in 1989. In 1990, however, both the total amounts coming through this channel as well as NRIs share fell down (Table 6.11). In the following years, the NRI investment increased in absolute terms but its

share has falled down to 12.25 percent in 1992 reflecting a higher growth rate for the investments coming through Non-NRI channels. Even the increase in absolute amount needs to be interpreted with caution because of the high rate of devaluation of rupee vis-a-vis major currencies of the world during the period.

TABLE 6.9

FOREIGN COLLABORATION APPROVALS IN INDIA: 1971-1992

YEAR	Total Number of Collaborations	Cases involving financial investment approvals	Percentage of cases involving financial investment in Total
1971	245	46	18.8
1972	257	36	14.0
1973	265	34	12.8
1974	359	55	15.3
1975	271	40	14.8
1976	277	39	14.1
1977	267	27	10.1
1978	307	44	14.3
1979	267	32	12.0
1980	526	65	12.4
1981	389	56	14.4
1982	588	113	19.2
1983	673	129	19.2
1984	940	148	15.7
1985	1041	256	24.6
1986	960	256	26.7
1987	903	259	28.7
1988	957	289	30.2
1989	639	212	33.2
1990	703	201	28.6
1991	976	298	30.5
1992	1520	736	48.4

Source : National Registrar of Foreign Collaborations, Department of Science & Technology, Ministry of Science & Technology, New Delhi; various yearly issues.

TABLE 6.10

SHARE OF NRI COLLABORATIONS IN TOTAL FINANCIAL COLLABORATIONS
(1988-92)

YEAR	Total Financial Collaborations	NRI Collaborations	(%)
1988	289	62	21.45
1989	212	44	20.75
1990	201	26	12.94
1991	298	48	16.11
1992	735	151	20.54

Source : National Registrar of Foreign Collaborations, Department of Science & Technology, Ministry of Science & Technology, New Delhi; various yearly issues.

Table 6.12 also shows the country-wise distribution of foreign investment over the period 1981-1992. The share of the US is highest the percentage of total amounts invested during this period. Other than that, Western Europe especially Germany and the UK, and Japan are important investing countries. The trend is simiar for NRI investment, except that the share of the US is larger (Table 6.13). Country-wise distribution makes in obvious that these NRI investments originate almost wholly from highly qualified manpower mainly from developed countries. A small proportion also seems to have come from developing countries probably originating from hqm who have both money and expertise. Table 6.13 also shows that the share of repatriable investments is larger (62.7%) compared to non-repatriable(37.3%)[49]

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49. There is a discrepency in Table 5.11 and 5.13. The total NRI investment for 1988-1992 period comes to be Rs.75900 lacs in Table 5.11 whereas in Table 5.13, it turns out to be Rs.81498 lacs. This has not been explained by the source. However, rounding off of smaller figures in Table 5.13 can be one reason.

TABLE 6.11

COUNTRY-WISE DISTRIBUTION OF FINANCIAL INVESTMENT THROUGH FOREIGN COLLABORATIONS
(1987-1992)

(Rs. in lakhs)

COUNTRY	1987		1988		1989		1990		1991		1992	
	Total	NRI	Total	NRI	Total	NRI	Total	NRI	Total	NRI	Total	NRI
Australia	343	50	10	-	300	-	63	9	265	-	7945	5
Austria	44		164	-	52	-	64	-	154	-	412	14
Argentina	20	20	-	-	-	-	-	-	-	-	-	-
Bahamas	-	-	-	-	-	-	-	-	-	-	75	-
Bahrain	-	-	-	-	-	-	-	-	-	-	830	-
Bermuda	-	-	-	-	-	-	-	-	-	-	334	-
Belgium	315	-	-	-	183	-	-	-	91	-	397	15
Brazil	-	-	40	-	-	-	8	-	1	-	11	11
Canada	86	20	64	6	117	87	66	-	449	20	371	125
China	-	-	-	-	20	-	-	-	75	27	-	-
Czechoslovakia	-	-	15	-	139	-	-	-	-	-	526	-
Cyprus	26	-	-	-	-	-	-	-	-	-	-	-
Denmark	66	-	100	13	4884	4300	278	6	1147	-	3829	578
Dubai	-	-	-	-	-	-	-	-	-	-	75	-
Finland	69	-	47	-	52	52	57	-	52	-	2679	77
France	536	-	1816	503	963	-	894	-	1814	2	3128	53
Germany	1659	446	3784	1258	1970	410	1811	16	2607	56	16671	5682
Hong-Kong	113	60	64	-	110	-	115	-	2094	56	9305	3298
Hungary	-	-	10	-	20	20	-	-	-	-	-	-
Indonasia	-	-	-	-	-	-	-	-	-	-	190	9
Ireland	-	-	25	-	-	-	-	-	-	-	1	-
Israel	-	-		-	-	-	-	-	-	-	179	30
Italy	810	182	3476	600	1137	791	883	201	1615	209	8424	1439
Japan	771	140	2438	125	3984	2683	424	12	8205	553	61915	272
Korea(South)	20	6	180	109	33	14	706	140	705	-	14043	1080
Kuwait	-	-	-	-	285	-	-	-	-	-	12	6
Luxemburg	-	-	40	-	-	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-	-	-	-	25	-
Malaysia	50	25	-	-	-	-	13	13	18	6	7443	-
Malta	-	-	-	-	-	-	-	-	-	-	13	-

CONTD....

TABLE 6.11 , CONTINUATION.

COUNTRY	1987 Total	1987 NRI	1988 Total	1988 NRI	1989 Total	1989 NRI	1990 Total	1990 NRI	1991 Total	1991 NRI	1992 Total	1992 NRI
Mexico	120	-	200	-	257	-	-	-	-	-	517	-
Netherlands	104	-	136	7	365	-	65		2558	268	9696	396
Newzeland	-	-	-	-	-	-	-	-	-	-	31	-
Norway	40	40	350	-	339	-	4	4	38	-	92	-
Oman	-	-	-	-	12	12	-	-	-	-	-	-
Philipines	-	-	-	-	-	-	-	-	-	-	500	-
Poland	-	-	-	-	33	-	-	-	4	-	-	-
Panama	16	-	-	-	-	-	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	-	-	16	-	120	-
Qatar	-	-	-	-	-	-	-	-	-	-	455	200
Russia/USSR+Ukraine +Ukraine	30	-	100	20	1169	-	500	-	434	-	1286	-
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	31	-
Singapore	124	-	817	5	674	95	137	-	424	28	6168	180
Spain	260	100	-	-	-	-	226	-	33	-	160	-
Sweden	224	75	44		565	62	648	100	899	500	6116	1028
Switzerland	896	40	1085	440	996	109	1361	50	4794	1055	67439	1548
Taiwan	40	20	56	-	20	-	64	-	40	-	1908	20
Thailand	-	-	-	-	-	-	16	-	-	-	36	-
UAE	38	38	-	-	-	-	100	50	220	-	966	210
UK	5030	138	1111	43	3971	651	941	206	4167	1375	12076	1789
USA	4549	1265	9831	819	6250	754	5114	2884	18850	5042	126157	13654
Uruguay	-	-	-	-	-	-	-	-	-	-	1	-
Virgin Island	-	-	-	-	-	-	-	-	-	-	51	-
West Indies	-	-	-	-	-	-	-	-	-	-	30	-
Yugoslavia	12	-	77	77	-	-	-	-	392	349	65	-
NRI(Country not specified)	539	539	973	973	235	235	364	364	724	724	15947	15947
TOTAL	16950	3204	27061	5006	29135	10275	14922	4055	52885	10270	388681	47666
%		18.9		18.5		35.27		27.17		19.42		12.26

Source : National Registrar of Foreign Collaborations, Department of Science & Technology, Ministry of Science & Technology, New Delhi; various yearly issues.

Note : Due to rounding off of figures, total figures for this table do not exactly coincide with the totals in some other tables.

TABLE 6.12

FOREIGN INVESTMENT 1981-1992

(In Rs. million)

COUNTRY	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	TOTAL	%
USA	22.50	73.60	138.90	132.00	589.80	390.00	454.90	983.10	625.00	511.50	1885.00	12615.70	18422.00	31.23
JAPAN	6.50	1011.10	160.80	72.70	171.00	56.20	77.10	243.80	398.40	42.40	820.50	6191.60	9252.10	15.69
SWITZERLAND	6.50	112.70	11.30	2.40	11.30	34.50	89.60	108.50	99.60	136.10	479.40	6743.90	7835.80	13.29
GERMANY	54.20	35.30	48.40	46.60	139.90	228.90	165.90	378.40	197.00	181.10	260.70	1667.10	3403.50	5.77
UK	7.10	25.10	98.00	42.10	40.90	81.40	503.00	111.10	397.10	94.10	416.70	1207.60	3024.20	5.13
ITALY	0.40	59.90	11.50	8.00	86.70	29.60	81.00	347.60	113.70	88.30	161.51	842.40	1830.60	3.10
NETHERLANDS	0.80	-	26.90	-	7.00	70.80	10.40	13.60	36.50	6.40	255.80	969.60	1397.80	2.37
FRANCE	0.80	25.80	8.00	16.60	59.80	19.00	53.60	181.60	96.30	89.40	181.40	312.80	1045.10	1.77
SWEDEN	-	15.30	8.00	15.80	18.70	47.50	22.40	4.40	56.50	64.80	89.90	611.60	954.90	1.62
OTHERS	9.90	149.20	106.90	791.40	278.20	299.70	240.80	334.00	865.50	278.10	743.00	7716.70	11813.40	20.03
TOTAL	108.70	1508.00	618.70	1127.60	1403.30	1257.60	1698.70	2706.10	2885.60	1492.20	5293.91	38879.00	58979.40	100.00

Source : National Registrar of Foreign Collaborations, Department of Science & Technology, Ministry of Science & Technology, New Delhi; various yearly issues.

TABLE 6.13

COUNTRY-WISE DISTRIBUTION OF NRI INVESTMENT THROUGH COLLABORATION

(Rs. in lakhs)

COUNTRY	1988		1989		1990		1991		1992		TOTAL (1988-1992)			
	A	B	A	B	A	B	A	B	A	B	A	B	A+B	%
Australia	-	-	-	-	9	-	-	-	-	5	9	5	14	0.02
Austria	-	-	-	-	-	-	-	-	14	-	14		14	0.02
Belgium	-	-	-	-	-	-	-	-	-	15		15	15	0.02
Bermuda	-	-	-	-	-	-	-	-	-	1		1	1	0
Canada	4	2	87	-	-	-	6	14	-	125	97	141	238	0.29
China	-	-	-	-	-	6	27	-	-	-	27		27	0.03
Denmark	-	13	-	4300	-	-	-	-	-	578		4897	4897	6.01
Finland	-	-	-	-	-	-	-	-	-	77		77	77	0.09
France	113	390	-	-	-	-	-	2	-	53	113	445	558	0.68
Germany	233	1025	386	24	16	-	55	1	5374	308	6064	1358	7422	9.11
Hong-Kong	-	-	-	-	-	-	-	56		3298		3354	3354	4.12
Hungary	-	-	20	-	-	-	-	-	-	-	20		20	0.02
Indonasia	-	-	-	-	-	-	-	-	-	9		9	9	0.01
Ireland	5	-	-	-	-	-	-	-	-	-	5		5	0.01
Israel	-	-	-	-	-	-	-	-	30	-		30	30	0.04
Italy	223	385	420	371	15	150	62	147	1	1438	721	2491	3212	3.94
Japan	30	95	2683	-	12	-	413	140	30	242	3198	477	3675	4.51
Korea(South)	16	93		14	140	-	-	-	350	730	506	837	1343	1.65
Kuwait		-	-	-		-	-	-	3	3	3	3	6	0.01
Malaysia	-	-	-	-	13	-	-	6	-	-	13	6	19	0.02
Netherlands	-	7	-	95	-	-	-	268	2	394	2	764	766	0.94
Norway	-	-	-	-	4	-	-	-	-	-	4		4	0
Oman	-	-	12	-	-	-	-	-	-	-	12		12	0.01
Qatar	-	-	-	-	-	-	-	-	-	200		200	200	0.25
Singapore	5	0.1	-	-	-	-	28	-	-	180	33	180	213	0.26
Sweden	-	-	62	-	-	100	200	300	-	1028	262	1428	1690	2.07
Switzerland	246	194	109	-	47	3	1018	37	13	1538	1433	1772	3205	3.93

CONTD....

TABLE 6·13, CONTINUATION.

Taiwan	-	-	-	-	-	-	-	-	20	-	20		20	0.02
UAE	-	-	-	-	-	50	-	-	-	210		260	260	0.32
UK	28	15	14	637	47	3	469	906	341	1448	899	3009	3908	4.8
USA	476	343	526	228	2631	253	226	4816	1988	11666	5847	23153	29000	35.58
USSR/Russia	-	20	-	-	-	-	-	-	-	-		20	20	0.02
Yugoslavia	68	9	-	-	-	-	-	349	-	-	68	358	426	0.52
NRI(Country not specified)	-	973	115	120	65	259	42	657	10836	3769	11058	5778	16836	20.66
TOTAL	1447	3564.1	4434	5789	2999	824	2546	7699	19002	27315	30428	51068	81496	100
%											37.3	62.7		

Note : (i) A = Non-Repatriable
B = Repatriable

Source : National Registrar of Foreign Collaborations, Department of Science & Technology, Ministry of Science & Technology, New Delhi; various yearly issues.

TABLE 6.14

SECTOR-WISE DISTRIBUTION OF NRI INVESTMENT THROUGH COLLABORATION
(1988-92)

(Rs. in lakhs)

SECTOR	1988	1989	1990	1991	1992	TOTAL (1988-92)	%
Chemical	1001	4773	236	6798	10578	23386	30.71
Electrical & Electronics	602	630	37	758	2246	4273	5.61
Industrial Machinery	14	-	120	3	166	303	0.4
Machine Tools	-	-	-	-	227	227	0.3
Mettallurgy	1077 *	1312 *	140	141	618	3288 *	4.32
Transport	6	-	-	-	16	22	0.03
Consultancy & R&D	11	-	2054	973	4817	7855	10.31
Textiles	-	-	-	297	2492	2789	3.66
Alternative Renewable Energy	-	-	-	-	310	310	0.41
Mechanical	13	87	-	40	518	658	0.86
Miscellaneous	2287	3447	1749	1235	24326	33044	43.39
TOTAL	5011	10249	4336	10245	46314	76155	100

* For the years 1988 and 1989, this includes consultancy and R & D Sector.

Source : National Registrar of Foreign Collaborations, Department of Science & Technology, Ministry of Science & Technology, New Delhi; various yearly issues.

Table 6.14 shows the sector-wise distribution of NRI investment which depicts chemicals to be the single largest sector during the period 1988-92. Consultancy and other services including research and development comes next. Lately, electrical and electronics and textiles seem to be a growing sector for NRI investment.

TABLE 6.15

COUNTRY-WISE DISTRIBUTION OF LUMPSUM TECHNOLOGY PAYMENTS BY INDIA
(1981-92)

COUNTRY	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
USA	240.63	605.46	397.95	289.49	1145.21	2121	-	1099.5	1271.7	488.7	2700.6	8385.8
Germany	131.14	235.8	226.55	362.12	165.89	1364.1	-	1074.9	1024.3	1105.9	1459.1	2412.4
UK	59.819	152.855	157.87	377.44	536.43	619.3	-	1242.8	552.4	358.5	1019	1180.5
Japan	30.78	192.87	117.6	237.42	262.53	494.4	-	705.4	351.1	234.5	1578.9	2464.9
South Korea	-	0.45	29.01	2.81	15.26	-	-	15	20.7	219.4	53.9	234.9
Italy	31.5	46.24	22.058	183.97	215.03	235.1	-	144.2	346.3	110.4	379.8	2525.7
France	38.98	268	70.79	159.13	150.87	87	-	494.7	587.1	238.1	524.4	781
Switzerland	24.82	96.43	58.14	10.29	85.48	221.2	-	495	420	156.4	321.8	1021.7
Sweden	18.75	31.81	18.99	7.14	43.49		-	30.6	63	107.7	215.8	845.1
Canada	0.12	0.26	10.98	11.05	77.35		-	13.6	1118.3	36.9	125	775.5
Others	-	-	442	1362.44	1807.76	740.2		523	12314	2684.9	1420.6	2185.2
TOTAL	576.5	1630.2	1551.9	3003.3	4505.3	5882.3	4182.6	5838.7	18068.9	5741.4	9798.9	22812.7

Source : National Registrar of Foreign Collaborations, Department of Science & Technology, Ministry of Science & Technology, New Delhi; various yearly issues.

What is significant about NRI colloborations is that they represent long term interest. All the NRI colloborations during the period discussed, are financial colloborations in which investments come in the form of equity. Technological colloborations imply short term interest and involve large lump sum contracted payments. Table 6.15 shows that there has been phenomenol growth in the amount paid as lumpsum technology paymnts during 1981-92. Country-wise distribution shows the similar trend - USA, Japan and Western Europe being the main suppliers of technolgy - as in the case of financial investment. However, a comparison reveals that except 1982 and 1992, the amount of lumpsum payments exceed amount of financial investments in all the years. Some times marginally and some times as highly as four times. Unfortunately, data is not available regarding profits and dividends remitted to NRIs on their investments.

Table 6.16(A) and (B) reveal the trend in direct investment by NRIs, as given by Reserve Bank of India. There is some sort of discrepency in two sets of data which can be explained to a great extent by differece in time periods - Table 6.16(A) refers to financial year i.e., April to March whereas Table 6.16(B) refers to calendar year i.e., January to December. However, the discrepency for one year - 1989 and 1989-90 seems to be too large to be explained by this fact. The published data (Table 6.16(B) do not specify about the constituents of these figures. The general similarity between the two sets of data (with one exception already mentioned) suggests that like the first set (Table 6.16(A)), this also includes investment in respect of permission granted to issue non-converitble debentures and advance NRI shares as also on cent percent export oriented units . Another facts which remains unexplained either from published or unpublished source, is whether investment by NRIs through colloboration is included in these data. It is however, assumed that they are included here as collaboration is one important form of direct private investment. The comparison of these tables with Table 6.13 shows that if investment on colloboration forms a part of total private direct investment, they form a small portion of it. This means, a bigger share comes from investmnt on non-convertible debentures, advance shares and more recently also on cent percent export oriented units.

TABLE 6.16(A)

NRI DIRECT INVESTMENT
(1986-87 TO 1992-93)

(In Rs. Crores)

	1986-87		1987-88		1988-89		1989-90		1990-91		1991-92		1992-93	
	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow
A. Repatriable														
(1) 40% scheme*	829.31	-	989.33	160.02	1186.22	196.89	1373.49	187.27	1583.19	209.7	1893.8	310.61	3670.14	1776.34
(2) 74% scheme#	54.55	-	72.53	17.98	83.17	17.9	92.07	8.9	99.51	7.44	100.6	1.09	100.6	-
(3) 100% Automatic approval scheme	-	-	-		-	-	-	-	-	-	6.52	6.52	79.63	73.11
B. Non-Repatriable	132.38		202.3	69.92	254.17	51.87	302.68	48.52	318.53	15.85	323.23	4.7	324.22	0.99
TOTAL	1016.24		1264.16	247.92	1523.56	266.66	1768.24	244.69	2001.23	232.99	2324.15	322.92	4174.59	1850.44

* Includes investment in respect of permission granted to issue Non-convertible Debentures to NRIs.

\# This includes NRI investment in 100% Export Oriented Units, permission granted to issue Non-coverti-ble Debentures to NRIs and advance share subscriptions (by NRIs).

Source : Reserve Bank of India(unpublished).

TABLE 5.16(B)

TRENDS IN YEARWISE FLOW OF NRI DIRECT INVESTMENT

(In Rs. Crores)

Calendar Year	Repatriation basis			Non-repatriation basis	Total
	40% scheme (a)	74% scheme (b)	Total	(c)	(a+b+c)
1986	254.96	8.6	263.56	63.93	336.09
1987	210.96	9.26	220.22	46.91	276.39
1988	174.65	18.09	192.74	42.83	253.66
1989	328.25	8.8	337.05	65.2	411.05
1990	194.1	8.36	202.46	17.24	228.06
1991	204.56	2.52	207.08	7.04	216.64

Source : Report on Currency and Finance, RBI, different volumes.

The general trend in private investment via NRI has been similar to that of external accounts - increase in later part of 1980s for some years, a fall towards end of decade followed by an increase in last two years since the data are in rupee terms, the recent increse needs to be interpreted with caution as there was a sharp fall in value of rupee during the period. However, the increase is quite phenomenol and hence a part of it can certainly be treated as real increase.

The investment on non-convertible debentures is also included in these figures of direct investment. Though these investments are quite important, they certainly need to be treated separately from direct investment as they slightly vary in their nature. Debentures are safe investments as they do not involve risk. They lack the element of venture and hence are not same as direct investment which necessarily involves long term interest and an element of venture.

In case of portfolio investment also, we have two sets of data, through the same source, pertaining to two types of periods - financial and calendar year. In this case, this totally explains the

TABLE 6.17(A)

TREND IN NRI PORTFOLIO INVESTMENT (Rs. in Crores)

PORTFOLIO INVESTMENT (Actual purchase of shares/ debentures)	1986-87		1987-88		1988-89*		1989-90		1990-91		1991-92#		1992-93	
	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow	Stock	Flow
1. Repatriation	53.03	-	64.32	11.29	70.99	6.67	74.37	3.38	76.48	2.11	79.68	3.2	109.26	29.58
2. Without repatriation	0.95	-	1.91	0.96	1.75	-0.16	3.03	1.28	6.8	3.77	7.2	0.4	8.77	1.57
TOTAL	53.98	-	66.23	12.25	72.74	6.51	77.4	4.66	83.28	5.88	86.88	3.6	118.03	31.15

* Figures as on 31.12.1988

\# Figures as on 31.12.1991

Source : Reserve Bank of India(unpublished).

Note : Stock figures are for 31st March of the year-end unless otherwise marked.

TABLE 6.17(B)

TREND IN YEAR-WISE FLOW IN NRI PORTFOLIO INVESTMENT

(Rs. in Crores)

YEAR	Portfolio Investment		
	On repatriation basis	Non- repatriation basis	Total
1986	4.90	0.39	5.29
1987	6.00	0.51	6.51
1988	7.52	0.39	7.91
1989	2.21	0.88	3.09
1990	2.41	3.77	6.18
1991	4.07	0.80	4.87

Source : Reserve Bank of India(unpublished).

difference in figures. The amounts involved in portfolio investment are small compared to other channels(Table 6.17(A) & (B)). However, there is a sudden increase in 1992-93 - again partly explainable in terms of fall in value of rupee and partly in terms of real increase. Investment in company deposits reveal a some what stagnant trend for the period 1983-92. (Table 6.18). The investment in schemes of Unit Trust of India have been growing consistently after 1987-88 (Table 6.19).

Table 6.20 gives the private long term capital flows in India's Balance of Payments, as given by Reserve Bank of India. Although they include foreign official loans received and repaid by private sector and also direct foreign investment and its repatriation they do depict a some what complete picture of the capital inflows and outflows associated with NRI, i.e. repatriable bank deposits and direct investment. These figures, however, do not include those NRI deposits which are for less than a year i.e. for six months. When this table is seen alongwith table 6.4 it becomes obvious that during first half of 1980s repatriable deposits framed a substantial portion of total long term capital flows. However, this trend seems to have changed in the later part of the decade. This means the share of other constituents of

TABLE 6.18

TREND IN NRI INVESTMENT IN COMPANY DEPOSITS

(Rs. in Crores)

COMPANY DEPOSITS (STOCK)	REPATRIATION	WITHOUT REPATRIATION	TOTAL
Sept'83 to Dec'89	19.87	9.08	28.95
Sept'83 to Dec'90	20.37	10.35	30.72
Sept'83 to Dec'91	20.41	11.38	31.79
Sept'83 to Dec'92	20.54	12.69	33.23

Note : The difference between two periods gives the figure for net inflow during the period.

Source : Reserve Bank of India (unpublished).

TABLE 6.19

TRENDS IN NRI INVESTMENT IN UNIT TRUST OF INDIA (various schemes)

(Rs. in Crores)

PERIOD (July-June)	AMOUNT	
	STOCK	FLOW
1984-85	6.37	-
1985-86	9.05	2.68
1986-87	14.75	5.7
1987-88	15.65	0.9
1988-89	18.48	2.83
1989-90	22.85	4.37
1990-91	31.81	8.96
1991-92	45.11 *	13.3 *

* Figures are provisional

Source : Reserve Bank of India (unpublished)

TABLE 6.20

PRIVATE LONG-TERM CAPITAL FLOWS IN INDIA'S BALANCE OF PAYMENTS

(Rs. in lacs)

YEAR	Credits	Debits	Net (All positive)
1980-81	21870	14160	7710
1981-82	29200	17360	11840
1982-83	44260	23450	20810
1983-84	96240	26570	69670
1984-85	146670	37400	109270
1985-86	261130	51900	209230
1986-87	321840	96090	225750
1987-88	395560	171790	223770
1988-89	776770	335370	441400
1989-90	1162760	685940	476820

Source : Reserve Bank of India, Report on Currency and Finance, annual issues.

Note : The above figures relate to private long-term transactions in the capital account where the original capital inflow is for one year or longer and include foreign official loans received and repaid by the private sector. The value of private short-term transactions in the capital account is negligible. The other major components of the capital account in the balance of payments are banking capital flows and official capital flows.

private long term capital flows increase towards the end of the eighties. One of them can be direct investment. Since, there is no way to seperate the value of other constituents - banking and official capital flows - nothing can be stated in definite terms. However, available information cetainly indicate that capital transactions through NRIs form a significant position of total long term transactions in India's Balance of Payments.

On the whole, direct investment in various forms by NRIs have assumed great importance in recent years. Till the end of eighties inflows through external accounts exceeded direct investment by NRIs. But, since the beginning of this decade, i.e, 1990s, the proportion seems to have changed. Direct Investment by NRIs exceeded the inflows through external accounts by a good margin (See table 6.4 and 6.6 for evidence). Since dirct investment reflect a long term interest, an increase in this shows growing confidence of investors in the economy. This change in trend can be considered significant.

Though contry-wise distribution of total NRI direct investments are not available, they are available for colloborations, which can be conveniently taken as indicative of the trend. In that case, we have seen that almost whole of NRI investment originated in developed countries of west. It obviously suggests the involvement of hqm in them as they are the main migrants to these countries and also because they have required money and expertise to participate in such investments.

The macro level trends in financial inflows suggest that emigrated hqm have been an important source of capital flows in various forms. The relative share of direct investment has increased and that of inflow in external accounts have declined. In general, the capital flows in all forms have increased in importance in late 1980s and early 1990s. Compared to that, the share of remittances in total flows through emigrated personnel has declined in 1980s. Unlike capital flows, hqm do not play that dominant role in supplying remittances, even then they have been supplying around of half of total remittances in the 1980s. The general process of de-licencing and various other measures of liberalisation alongwith many incentives of NRIs in various forms seem to have attracted possible results in case of private investment.

6.5.TRENDS IN FINANCIAL INFLOWS: MICRO LEVEL EVIDENCES THROUGH SURVEY OF IIT MIGRANTS :

Some evidences on financial inflow through IIT migrants were also collected in the survey carried out on them. These evidences have been presented here in tabular forms.

TABLE 6.21

AMOUNT OF REMITTANCES SENT BY MIGRATING IIT PROFESSIONALS
(Per Year)

Amount of Remittances (in '000 US dollars) (Range)	Number	Percentage
1-5	55	50
5-10	7	6
10-15	2	2
15-20	2	2
20-25	7	6
No remittance	37	34
TOTAL	110	100

Note : The first range includes $5000
and 2nd starts from more than $5000.
Accordinlgy the rest of the graphs are also formed.

Table 6.21 reveals that as high as 34% of migrating IIT graduates do not send any remittance whereas a large percentage (50) send remittances ranging between 1000 and 5000 US dollar annually. 8% of them send remittances ranging from 5000-15000 US dollars and another 8% remit something between 15000 and 25000 US dollars annually. The average annual remittance per migrant turns out to be US$3373 which is for the whole period (1970-85) and all the respondents (110). Though this kind of calculating average has its own limitations, it cetainly gives an indication. What is remarkable here is that this average is much higher than the average calculated by Nayyar (1994).[50] According to that calculation, per capita remittance were Rs.3415 for North America Rs.10024 for Western Europe Rs.3417 for Britain and Australia in

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50. See Nayyar(1994) op cit.

1980-81 and Rs.20,155 for middle-east Since majority of the respondents live in USA, the estimated average of Rs.3415 can be compared to the sample average - which is much larger. The size of remittances, as explained by respondents, mainly depended on the needs of the family and had no relation with income of the migrants.

TABLE 6.22

DISTRIBUTION OF REMITTANCES SENT BY IIT MIGRANTS AMONG VARIOUS USES
(Percentage)

Number of Migrants (Total=73)	Remittances for		
	Consumption	Investment	Charity
45(61)	100	0	0
10(12)	90	10	0
4(6)	50	50	0
2(3)	50	0	50
4(6)	20	80	0
2(3)	10	90	0
2(3)	0	100	0
4(6)	0	0	100

Note : Figure in parenthesis in column 1 shows the percentage of migrants taking total as 73 - all those who send remittances. and excluding those who do not send remittances.

Table 6.22 shows the distribution of remittances as between different uses - identified as consumption, investment and charity. Though the remittances are used by households are other receipients of remittances - usually the senders also have fairly good idea about the use of the money they are sending. This table is entirely based on senders responses about the use. The whole amount of remittances is used for consumption by 61% of the reciepient households and another 12 percent use 90% of remittances for consumption. The share of consumption is 50% for another 9% of the reciepients. Only 12% of reciepient households spent 80-100% of remittances on investment. What is most interesting about this table is that 6

of the respondents remit money to voluntary organisation on charity basis. They either send money directly to particular organisations engaged in rural development or the development of other deprived sections or have formed some organisation there in their country of residence through which they send money. Few such cases have been discussed in detail in previous chapter. Since these remittances are spent on result oriented developmental programmes - they have been considered as investment in the economy, and accordingly included in Table 6.22. However, in general, these evidences are in line with other micro level studies concerning use of remittances as far as the use of maximum share consumption is concerned.[51]

TABLE 6.23

DISTRIBUTION OF CAPITAL FLOWS THROUGH IIT MIGRANTS BY VARIOUS TYPES

	Number of Migrants	Type of Investment
1.	59 (54)	No Investment
2.	15 (14)	Only Bank Accounts and NRI bonds
3.	10 (8)	Only Real Estate
4.	4 (4)	Only Shares
5.	4 (4)	Only Agriculture/Plantation/Farm upgradation
6.	9 (8)	Only manufacturing/business
7.	7 (6)	Real Estate + Shares
8.	2 (2)	Bank Account + Manufacturing
	110 (100)	

Note : Figures in parenthesis show percentage of migrants in that category.

51. Report of the Survey on the utilization of Gulf Remittances in Kerala. Department of Economics and Statistics, Trivandrum, December 1987.

In case of capital flows, most of the respondents refused to divulge any information regarding the amounts. However, they did provide information on the type of investment they have made. More than half of the respondents had not made any investment till the time they replied to the questionnaire(Table 6.23). The rest of the respondents(46%) have made investment in some form - bank deposits, shares, manufacturing, real estate, agriculture. NRI accounts and other bonds seem to be the most popular rest of investment. However, only 14% of respondents have invested in these schemes and hence though most popular relatively, they do not seem to be very popular in themselves. However all of them (100%) felt that opening up of economy was in the right direction and welcome the liberalisation in general. All those who had no investments till then expressed their desire to do so in some form or the other in future. In general, they seemed more interested in some kind of investment which would also use their expertise. Some of such cases have also been discussed in the previous chapter in detail.

On the whole, the micro level evidences or IIT emigrants do not totally confirm to the macro level evidences. In case of remittances for emigrant remittance for IIT emigrant from a developed country seems to be much larger than the average suggested by the macro level evidence. Though the general trend in use of remittances is confirmed to the existing nations, there is no macro level evidences avaialble as such. In that also certain interesting factors like remittances to voluntary agencies have come up. In case of capital flows, the evidences available for IIT respondents do not tell much except that they seem to be welcoming towards opening up of the economy. In this context, case studies, as discussed in the last chapter have provided greater insight.

6.6 FINANCIAL INFLOWS AND BALANCE OF PAYMENTS(BOP):

In macro economic context, the financial inflows originating through emigrating Indian are most significant for the Balance of Payments adjustments. Tables 6.24 and 6.25 show the significance of remittances and NRI deposits in relation to the selected components of India's BOP. It is seen that at its peak in 1975-76, remittances could finance upto 74.8 percent of balance of trade deficit. All through late seventies and early eighties, remittances were large enough to pay for one-third to half of the trade

TABLE 6.24

THE SIGNIFICANCE OF REMITTANCES

VIS-A-VIS SELECTED COMPONENTS OF INDIA'S BALANCE OF PAYMENTS

YEAR	Remittances as a percentage of		
	Balance of Trade Deficit	Current Accounts Receipts	Interest on Foreign loans plus Amortisation
1970-71	19.1	4.2	18.5
1971-72	25.5	5.3	24.9
1972-73	41.5	4.3	20.6
1973-74	37.6	3.1	26.4
1974-75	22.5	5.4	45.3
1975-76	74.8	7.3	81.6
1976-77	197.2	8.6	107.8
1977-78	853.3	11.1	122.7
1978-79	51.2	10.8	128.9
1979-80	43.6	13.7	180.6
1980-81	36	17.2	220.7
1981-82	34	15.3	205.2
1982-83	42.1	16	183.1
1983-84	45.1	15.5	158.1
1984-85	44.4	14.7	134.5
1985-86	28.3	13.9	95.7
1986-87	32	13.9	65.4
1987-88	38	13.8	63.5
1988-89	28.5	12.2	59.6
1989-90	30.8	9.4	52.3
1990-91	24.2	7.9	42.9

Sources : (a) For data on balance of trade deficit and current account receipts, Reserve Bank of India, balance of payments statistics published in the REPORT ON CURRENCY AND FINANCE, annual issues.

(b) For data on interest on foreign loans plus amoritisation, Ministry of Finance, ECONOMIC SURVEY, data on balance of payments(adjusted), various issues.

(c) For data on remittances, Table 6.3 . Table Taken from Nayyar(1994)

Note : There was a surplus in the balance of trade in 1976-77, while there was a deficit in all other types.

TABLE 6.25

THE SIGNIFICANCE ON DEPOSITS MADE BY NON-RESIDENT INDIANS
IN RELATION OF SELECTED ITEMS IN INDIA'S BALANCE OF PAYEMNTS

YEAR	Net Inflows into External Accounts of NRIs as a percentage of		
	Current Account Deficit	Capital Account Receipts	Net Aid Inflows
1980-81	10.7	5.3	13.1
1981-82	8.9	7.9	19.8
1982-83	16.7	10.3	29.4
1983-84	31.3	14.3	57.4
1984-85	30.8	14.9	74.6
1985-86	29.8	22	112.6
1986-87	28.3	13.8	104.7
1987-88	29.2	10.7	75.8
1988-89	23.7	11.6	104.5
1989-90	22.1	7.8	102.8
1990-91	3.1	-	17

Source : (a) For data on the current account deficit and capital account receipts (excluding transactions with the IMF), Reserve Bank of India, balance of payements statistics published in REPORT ON CURRENCY AND FINANCE, annual issues.

(b) For data on net aid inflows, Ministry of Finance ECONOMIC SURVEY, various issues.

(c) For data on net inflows into external accounts of non-resident Indians, Table 6.4 for non-resident external rupee accounts, the above calculations use the figures on net inflows excluding accrued interest. Taken from Nayyar (1994)

deficit. In late 1980s, however, this percentage fell down. Even then, they were able to compensate for one-fourth to one-third of the total balance of trade deficit. Remittances were consistently greater than the payments needed for debt servicing during the whole period of late 1970s and early 1980s. However, compared to other sources, remittances always remained a smaller source of current account receipts, consisting 10to 15 percent of total for most of the years.

NRI deposits formed around 10 to 15 percent of capital account receipts during the 1980s. Towards end of that decade both remittances and net inflows in NRI deposits fell down, as seen earlier, and obviously their significance as compared to other components of BOP situation also fell down. However, NRI deposits could finance 20 to 30 percent of current account deficits in most years during 1980s. During second half of the eighties, these inflows were also higher than the net foreign aid inflows.

In order to explain the role of financial inflows associated with emigrants in the Balance of Payments and through that on the economy as well as the significance of related policies, the help of a theoretical model can be taken. Here, we are taking a three market model for an open economy which requires that the goods market, the money market and the balance of payments (the foreign exchange market) all be in equilibrium simultaneously to attain full equilibrium in the economy.[52]

THE BALANCE OF PAYMENTS EQUILIBRIUM :

The BOP is said to be in equilibrium when there is no excess demand for or supply of foreign exchange at the equilibrium exchange rate arrived at. It is, however, rarely that the BOP equilibrium would mean that there is equality of demand and supply in both current and capital accounts - the two components of BOP. Usually it would mean that current account deficit (which is mainly due to balance of trade deficit i.e. X<M) would be covered by a surplus in the capital account. When income Y is rising

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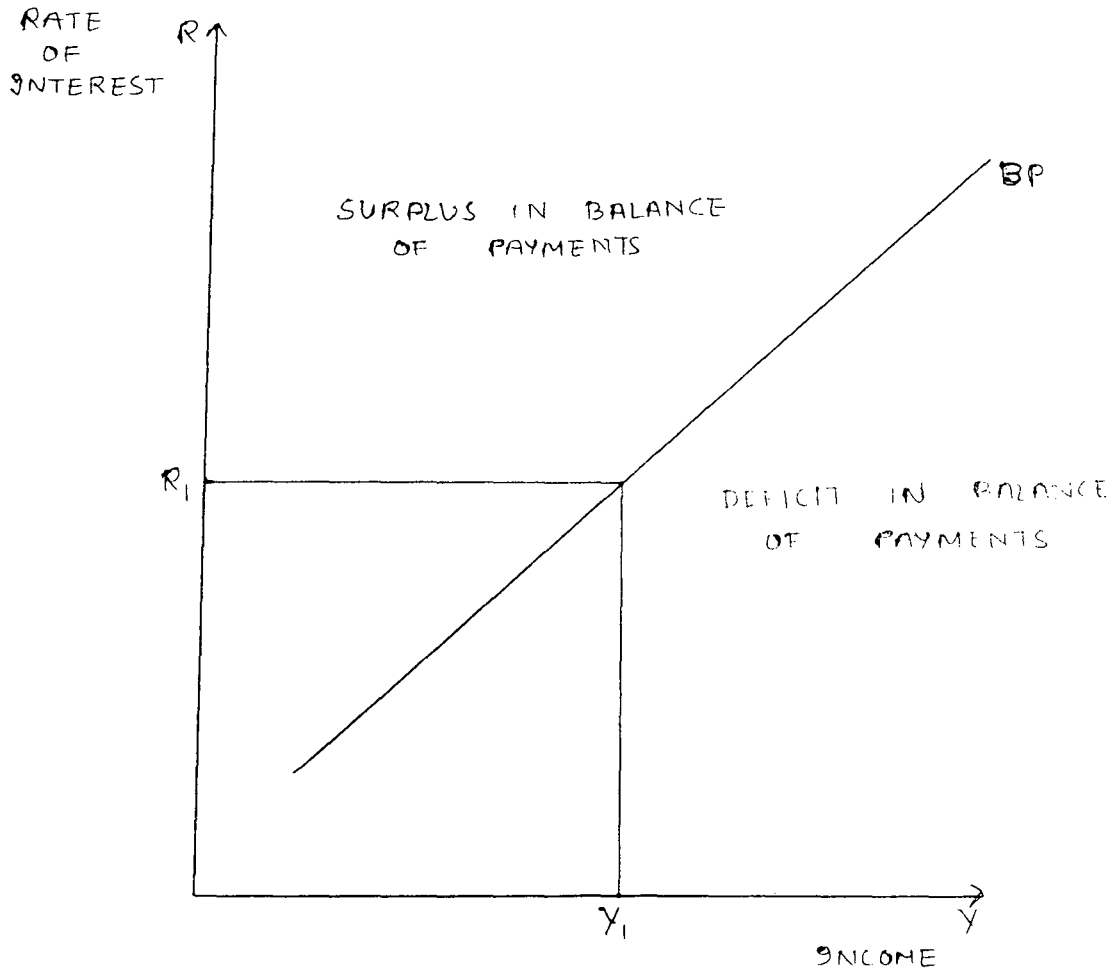
52. The model has been taken from Shefferin, Steven M., David A. Wilton and David M. Prescott; Macro Economics:Theory and Policy; South Western Publishing Company, Ohio, 1988.

Figure 6.1 : Balance of Payments (BP) Curve



over time, for example, one would expect imports to increase in most economies (Japan is an exception) and the balance of trade thereby gets worse. If this has to be counter-balanced by capital inflows, the rate of interest R has to rise to attract capital from abroad. This is the motivation of the following diagram introducing the balance of payments equilibrium BP curve.

The diagram shows BP as upward rising. It shows the combination of Y and R that would keep BOP at equilibrium (eg Y1 and R1). If the rate of interest rises above R1 at Y1 then more capital inflow will create a BOP surplus (and an excess demand for domestic currency in the world market); if or falls below R1 at Y1 there will be opposite effects.

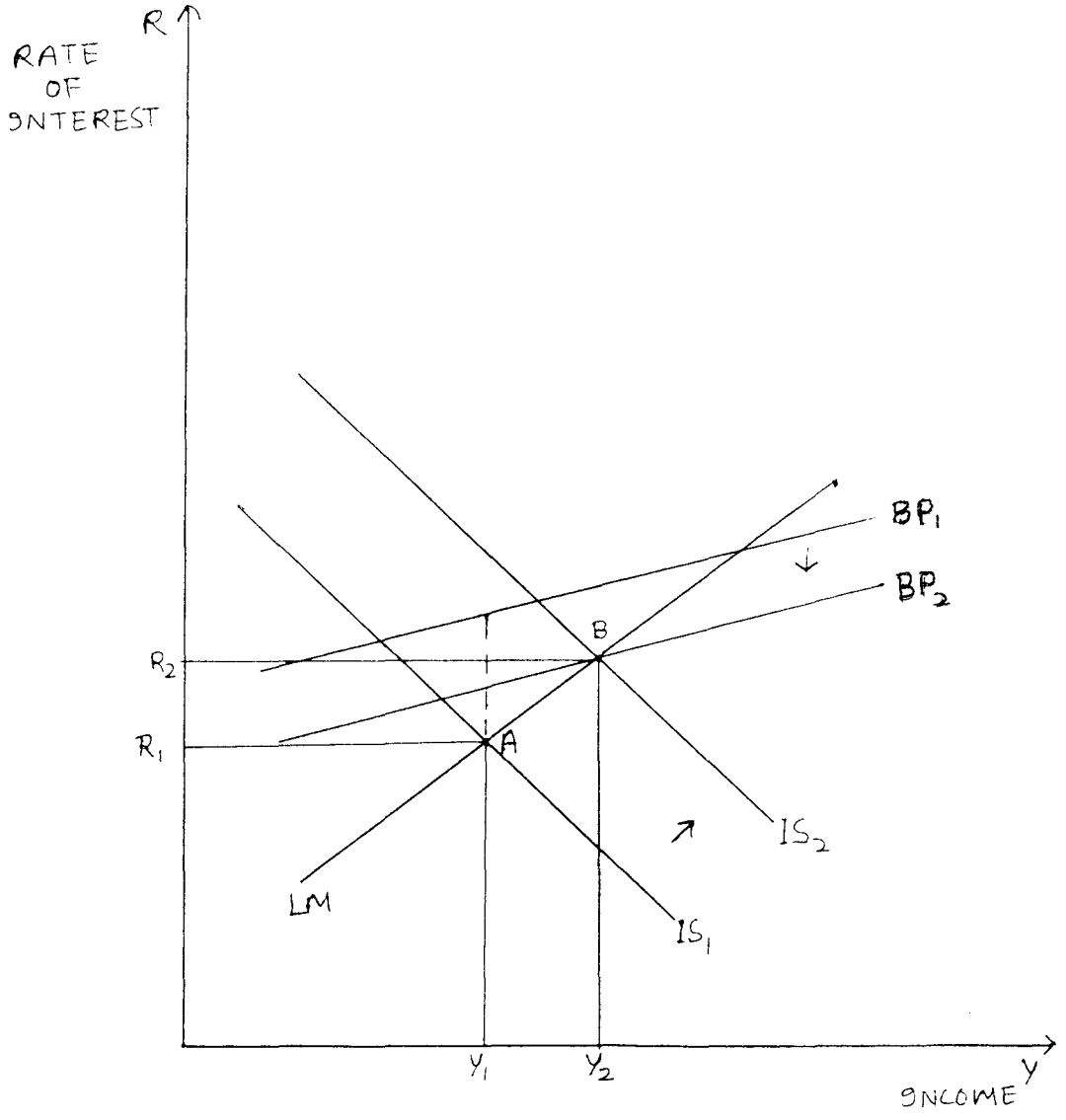
It may be remarked here that BP curve is likely to be relatively flatter as the domestic economy grows. This is for two reasons (i) with the expansion of the capital base the need for vital imports of capital goods and raw materials like oil may decrease and exports might increase in the world market because of the export industries better adapting to world demand, and (ii) if the capital market is better developed and the credit rating of the domestic industries improve in the world market, even a small increase in R would attract larger inflows of capital. It is well known that BP curves for some highly industrialised countries are relatively flat precisely because of the high sensitivity of capital flows to the changes in the rates of interest of these countries.

BALANCE OF PAYMENTS ADJUSTMENT UNDER FLEXIBLE EXCHANGE RATES

As pointed out earlier, in case of full equilibrium, the equilibrium level of income and interest rate must lie on the IS curve, LM curve and BP curve simultaneously. The diagram shows BOP adjustment under conditions in which the Central Bank does not interfere in the foreign exchange market - the rate of exchange being freely determined by demand for and supply of foreign exchange.

The economy is initially at A with Y1 and R1. The IS and LM are at equilibrium at this point . There is, therefore, a BOP deficit, R1, being too low. There is an excess demand for foreign exchange and as a result the domestic currency depreciates.

Figure 6.2 : Internal (Real and Monetary) and External Equilibrium in an open economy under Flexible Exchange Rates.



The depreciation has two consequences: (i)foreign goods being dearer now, the demand for domestic production increases leading to a shift in IS towards right, (ii)for the same reason imports decline; domestic goods appear cheaper in the world market and so exports rise; as a result BP shifts downwards. The macroeconomic equilibrium is obtained at intersection of IS_2, BP_2 and LM.

It can be noted that LM is not expected to move because (a) domestic prices are assumed to be fixed; and (b) the quick change in the exchange rate absorbs pressure in the money market that otherwise would have created some change if the Central Bank bought or sold foreign currency on a large scale to keep the exchange rate fixed.

Next, we will look at the effects of (a)monetary policy and (b)fiscal policy under these conditions.

(a) <u>EFFECTS OF MONETARY POLICY</u>

A is the initial equilibrium point with Y1 level of income and R1 rate of interest. An increase in the money supply shifts LM to the right from LM1. If BP did not exist, the economy would have made the first round move to B. But this move would create a BOP deficit, the domestic currency will depreciate and the IS curve would move to the right. BP curve would move downwards for reasons explained earlier. The new three-market equilibrium is at C with Ye income level and R_2 interest rate.

It can be noted that point C is to the right of point B showing larger multiplier effect on income, compared to what would have in a closed economy. This is because the foreign-exchange-rate effect of monetary expansion reinforce interest rate effect and make monetary policy a potentially more potent policy tool when the exchange rate is flexible.

(b) EFFECTS OF FISCAL POLICY

The initial three market equilibrium at A is disturbed with an increase in Government spending which shifts IS from IS_1 to IS_2. Income moves from Y_1 to Y_2. But B, the new IS-LM equilibrium, is above BP1 which means a surplus in BOP - this leads to appreciation of the domestic currency. As a result, demand for domestic goods fall and IS falls back and BP rises due to less expensive imports and less rewarding C. It can be noted that C lies to the left of B - which means that fiscal policy is less successful in an open economy, if exchange rates are flexible. This is because indirect BOP effects of fiscal policy work against the direct expansionary effect in this case.

In 1972, the rupee was pegged to Pound Sterling and floated. As a result of downward floating of Pound, the rupee depreciated against US dollar and also against SDR basket of currencies during the first half of 1970s. This almost eliminated the gap between official and market exchange rate and led to channelization of remittances through official sources which explains, along with certain other factors working at the international level, the sharp rise in value of remittances during the period. Though the exchange value of rupee kept depreciating throughout the 1970s and 1980s, against US dollar and SDR basket of currencies, it failed to bridge the gap between official and market exchange rate, which had reappeared. This explains the falling rate of remittances during late 1980s to some extent. Remittances, however, helped to keep current account deficit in BOP statistics at a lower level to a large extent during late 70s and early 80s and to a smaller extent during late 1980s, as seen earlier.

The current account, however, always showed a deficit during this period mainly due to adverse balance of trade and hence, to cover that capital inflow were needed. During 1980s, as revealed earlier, NRI deposits helped in financing the current account deficit to some extent. Exchange rate was closely related to the inflow of NRE account which was not the case for FCNR account which covered the exchange rate risk. Inflows in NRE account, however, were quite large considering the sharp depreciation of rupee against major currencies during first half of the 1980s. Inflows in FCNR account can be taken as sensitive to rate of interest. Compared to developed countries, India needed a higher rate of interest to

attract capital inflows due to underdeveloped money market and the BP curve has been relatively steeper. Towards the end of 1980s, high rate of interest was not able to sustain inflows in this account due to adverse inflows in both the accounts turned into negative as a result of huge net outflows. During early 1990s, depreciation of rupee, and liberalisation of economy have helped introduction of convertibility in the trade account in stimulating the inflows into these accounts.

It can be noted here that international credit rating is an important factor in determining the capital inflows. In this matter, as the period of late 1980s shows, NRI investors perceived the unstable political situation in the same way the other international investors would have done and withdrew the money. It is quite probable that NRIs, due to micro level accounts which can be biased and exaggerated in many cases, are more sensitive to political situations in the country compared to other foreign investors. And, more or less, these inflows in bank accounts are seen primarily as source of foreign exchange required to fill the BOP deficit and not as additional resources for investment in the economy. In any case, they are short to medium term deposits, meant to provide benefits in the form of rate of interest to the investors. Hence, there is no reason why such capital should be invited from NRIs only, by paying a heavy price and why not any other form of borrowing can be resorted to in case of need.

We have seen in the three market models that monetary policy is more effective in an economy under flexible exchange rate system. The Indian system though not totally determined by market forces has enough space that allows the exchange rate to fluctuate on the basis of market forces. The Indian situation is, however, more complex due to two reasons (i) High rate of unemployment, and (ii) the rising price level leading to high rates of inflation during most of the time. The huge budgetary deficits are often resorted to in order to expand the economy leading to high rates of inflation. Due to rise in income and high propensity to import, the import bills which is not supported by the rising exports leading to deficit in balance of trade. Moreover, the share of consumer goods remains quite high, thereby not contributing to the production or employment capacity of the economy. Capital flows are required from abroad to fill the gap in the BOP - caused by adverse balance of trade. The policy mix needs to be such that capital imports lead to an increase in the rate of domestic investment in such a way that it affects the balance of trade positively by promoting export and substituting import. A lower or no deficit in the

current account can enable lowering of the rate of interest. Monetary policies are certainly more effective as long as the floating exchange rate behaves in a flexible manner. What is really needed, however, is a proper synchronization of monetary, fiscal and exchange rate policies - working towards the same direction.

In this regard, it becomes pertinent to point out here that long run private investments are more important compared to short-medium term deposits. Here it can also be noted that NRIs became more significant because of two reasons - (i) in the long run, ownership of assets by Indians are more desirable compared to foreign nationals for social and political reasons, and (ii) NRIs specially HQM, being rich in human capital resources, can play a major role in transfer of technology and also in building up of technology. As seen in the cases discussed in the previous chapter, NRIs seem to be interested in investing in their areas of speciality and this can be tapped by adopting right policy on that line. This factor assumes special importance because of greater emphasis of the western countries on patent laws and intellectual property rights.

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Chapter VII

THE INDIAN RESPONSE : TRENDS AND POLICIES RELATING TO HUMAN CAPITAL FLOWS

Capital in the form of education and training, i.e. human capital, is another critical resource which goes from the home country when hqm migrate. That, at times, may prove more important for any country depending upon her needs, and the "brain" in term "brain-drain" refers to that. Since most of the emigrating hqm from India first join some course of higher education in their countries of destination, that certainly adds to their possession of this critical element. Work and exposure in the developed countries further add to it. Hence, these migrants also accumulate this form of capital, other than finances, which is very important for the development of any country. Any country can have three types of policies to regulate the flow of human capital related with hqm migration - (i) Policies relating to out migration; (ii) Policies relating to return migration, and (iii) Policies relating to use of human capital content, i.e. education and training of emigrated individuals without their permanent return. This chapter summarises the existing policies and programmes in India in this respect from the perspective of above categorisation and also analyses the available evidence on trends of such flows.

7.1 POLICIES AND TRENDS RELATING TO OUT-MIGRATION

There is virtually no policy apparatus to control, restrict or stop out migration of hqm. The Indian Government has never imposed any regulation on trained and qualified persons from any field in going abroad for either training or job or for higher studies. Nor does it prevent anybody from emigrating permanently. No policy intervention is there even to make few years of job mandatory in the home country before emigration. No measures in the form of disincentives to go and settle abroad exists for hqm.

This policy of total non-intervention has two probable explanations. One is the democratic nature of Indian politics. In a democratic set up a persons is considered free to decide about one's education and settlement and hence cannot be prevented from going to any part of the world of one's own

choice. The other explanation is the importance which is generally attached to foreign education and training in most of the developing countries. Many of today's developing countries were colonies of developed countries in the past and carry the colonial hang-up. More than psychological, it is real in the Indian context, as it has chosen the western model of development as well as education. In most cases better facilities are available in western countries for such education and training. As we saw in chapter IV, most of the IIT migrants migrate the same year they finish their course in IIT for their higher education abroad. In that sense, their migration can be seen as a continuation of their studies first which turns into permanent migration for some of them at a later stage. As such, the government also sees migration of hqm to the western world as part of an opportunity to train their hqm with better facilities. It becomes more obvious in the nature of certain programmes started by the Indian government - a point which would be discussed later in this chapter.

The trends in out-migration of Indians to the Developed countries can be seen in Appendix-III. The trends for IIT graduates have been discussed earlier in Chapter III.

7.2 POLICIES AND TRENDS RELATED TO RETURN-MIGRATION OF HQM:

In the previous chapter, we have seen that several incentives existed in the form of bank accounts and certain other benefits for those Indians who return permanently. This section emphasises on policies which relate to use of their brain for the sake of country's economy and development. Though no comprehensive set of policies exist in this context, certain schemes are in operation to help those who decide to return. There is only one important scheme meant for those hqm who want to return permanently and work here - Scientist Pool.

The Scientists Pool was constituted by the Government of India as early as 1958 to provide temporary placement to Indian Scientists, Engineers, Technologists and Doctors returning from abroad. It, however, also includes sometimes those persons who have not been abroad but have outstanding qualifications. The Council of Scientific and Industrial Research(CSIR), the nodal agency to deal with the

research in the field of science and technology, maintains an Indians Abroad section of the National Register of Scientific and Technical Personnel. All persons enrolled in Indians Abroad section, who do not hold any employment in India nor are assured of one on return, are considered for selection to the Pool. Selection to the Pool are made on a continuous basis, by UPSC in consultation with Special Recruitment Board, on the basis of academic record, professional experience, research publications etc. and sometimes supplemented by interview. They are then given placements in national laboratories, IITs and other places of eminence. If there is a gap between the return of a person and his/her placement, he/she is attached to CSIR with a salary of a Class I officer. However, no annual increments is given during this period.

The basic aim of Pool scheme is to provide confidence about employment and proper placement after returning to India from abroad. The scheme, however, does not seem very attractive as far as incentives to come back are concerned. The salary scale of 2200-4000 (at present) without any increment is not attractive enough to work as an incentive. It, however, certainly gives a sense of security to return migrants.

The detailed information concerning those personnel who were selected for the scheme are available to us only upto 1984. However, with the help of those information along with he scanty evidences available for later period, certain trends can be identified.

A total of 18,519 personnel were selected to the pool for a period of thirty two years from 1959 to 1991. This means, on an average, 579 persons per year were selected. According to field of training, year-wise data is available for the period 1959-1982(Table 7.1). More than 70 percent of the total personnel selected belonged to science, technology and engineering field. All those selected, however, do not join and only about half of the total personnel selected - 9434 out of 18,519 - joined during the period 1959 - 1991. Majority of the scientists and engineers who joined the pool were trained in the US and majority of medicine personnel were trained in the UK. Around a fifth of these personnel had not been trained abroad(Table 7.2).

TABLE 7.1

YEAR WISE NUMBER SELECTED TO THE SCIENTISTS POOL ACCORDING TO THE FIELD OF TRAINING

Year of Selection	Science	Social Science	Engineering	Technology	Medicine	Total
1959	77	0	69	26	25	197
1960	50	0	60	15	38	163
1961	240	3	160	26	98	527
1962	120	7	79	28	159	393
1963	185	5	365	37	247	839
1964	265	7	485	37	345	1139
1965	324	8	321	49	266	968
1966	205	10	162	33	219	629
1967	187	20	156	24	220	607
1968	263	12	113	20	191	599
1969	321	18	167	18	219	743
1970	280	9	151	15	227	682
1971	364	14	215	18	160	771
1972	356	27	369	21	164	937
1973	248	10	245	16	138	657
1974	363	19	253	23	178	836
1975	284	12	183	18	140	637
1976	281	14	148	16	113	572
1977	236	10	204	22	186	658
1978	280	6	140	21	236	683
1979	170	5	99	12	104	390
1980	152	19	87	9	84	351
1981	185	16	80	10	152	443
1982	346	22	70	12	108	558
Total	5782 (38.6)	273 (1.82)	4381 (29.24)	526 (3.5)	4017 (26.8)	14979
1983-91	n.a.	n.a.	n.a.	n.a.	n.a.	3540
Total	n.a.	n.a.	n.a.	n.a.	n.a.	18519

Notes:

(i) n.a. — not available

(ii) Figures in parenthesis represent percentage.

Source : Technical Manpower Bulletin, CSIR various issues.

TABLE 7.2

NUMBER OF POOL OFFICERS WHO JOINED THE SCIENTISTS POOL UPTO 31st DECEMBER, 1983 BY COUNTRY OF TRAINING AND FIELD OF STUDY

Country of Training	Science	Social Science	Engineering	Technology	Medicine	Total	Percentages
U.S.A.	1176	47	472	78	259	2032	28.5
Canada	183	10	80	8	42	323	4.5
U.K	322	18	352	68	1266	2026	28.4
West Germany	145	7	95	17	14	278	3.9
O.E.C.	221	18	91	26	19	375	5.3
USSR	121	31	257	6	58	473	6.6
O.F.C.	125	6	66	5	22	224	3.2
INDIA	986	41	68	20	274	1389	19.6
Total	3279	178	1481	228	1954	7120	100
Percentages	46	2.6	20.8	3.2	27.4		100

O.E.C. - Other European Countries

O.F.C. - Other Foreign Countries

Source : Technical Manpower Bulletin, CSIR, Feb-March, 1984
Vol.XXVI, No.223

Waiting period between joining of pool and final placements vary between less than a year to three years or more. For the engineers, the waiting period seem to be the least, followed by medicine professionals. For both general and social scientists, it seems to be the largest (Table 7.3 & 7.4). Unfortunately, no evidence is available on the relationship between place of training and waiting period. This would have given the idea whether training and higher education abroad adds to their desirability. CSIR publishes bio-data of pool officers waiting for placements at periodic interval. A look at these for the period 1991-93 reveals that most of the published bio-data showed no training or education abroad.

This can be either due to the longer waiting period of those who do not have any degree or training from abroad or it is just that the percentage of persons with no training abroad has increased in the pool.

TABLE 7.3

DURATION OF STAY IN THE SCIENTISTS POOL OF POOL OFFICERS WHO WERE WORKING AS ON 31st DECEMBER, 1983

Duration of stay	Science	Social Science	Engineering	Technology	Medicine	Total	Percentages
Over 24 months	23	4	1	4	2	34	7.7
18-24 months	75	6	7	1	13	102	23.1
12-18 months	49	7	7	0	20	83	18.8
6-12 months	82	7	5	1	17	112	25.4
Less than 6 months	71	4	10	3	22	110	24.9
Total	300	28	30	9	74	441	100
%	68	6.3	6.8	2	16.8	100	

Source : Technical Manpower Bulletin, CSIR, Feb-March, 1984
Vol.XXVI, No.223

On the whole, the pool has been playing the role of providing confidence to return migrants and helping them to find suitable placement. Meanwhile, they keep adding to their experience by working as pool officers attached to various organisations. Table 7.5 shows the distribution of placements by types of organisations while these personnel were working as pool officers. Detailed data regarding sectors of employment of pool officers after leaving the pool is available for lesser number (Table 7.6). More than half of the pool officers were attached to universities and other educational institutions, whereas in the final placement only 37.5% have joined this sector. Private industrial establishments were joined by around 10 percent of pool officers after leaving the pool. R&D organisations remain one important sector both for attachment of pool officers and for final placement.

TABLE 7.4

DURATION OF STATY IN SCIENTISTS POOL OF ALL POOL OFFIERS WHO HAD LEFT THE POOL AFTER JOINING (AS ON 31.12.1983)

Field of Study		Science	Engineering	Technology	Medicine	Social Science	Total
Stay in Pool							
Less than 12 months	(Number)	1268	910	124	1081	65	3448
	(%)	42.6	62.7	56.6	57.5	41.7	51.6
12-24 months	(Number)	1035	405	63	547	54	2104
	(%)	34.7	27.9	28.8	29.1	34.6	31.5
24-36 months	(Number)	527	114	25	199	32	897
	(%)	17.7	7.9	11.4	10.6	20.5	13.4
36 months or more	(Number)	149	22	7	53	5	236
	(%)	5	1.5	3.2	2.8	3.2	3.5
Total		2979	1451	219	1880	156	6685

Source : Technical Manpower Bulletin, CSIR
February-March 1984, Vol.XXVI, Nos.2,3

TABLE 7.5

PERCENTAGE DISTRIBUTION OF PLACEMENT OF POOL OFFICERS WHILE ATTACHED TO THE SCIENTISTS POOL

Sector	Total Placements till 31.12.1983 (%)
1. Universities and other educational institutions	56.6
2. Hospitals	11.7
3. CSIR Organisations	10.8
4. other R & D Organisations	10.1
5. Industrial Organisations	5.8
6. Government Departments	3.4
7. Defence Organisations	1.6
Total	100

Source : Technical Manpower Bulletin, CSIR
February-March, 1984, Vol.XXVI, Nos.2,3

TABLE 7.6

SECTOR OF EMPLOYMENT OF POOL OFFICERS AFTER LEAVING THE SCIENTISTS POOL

Sector	Number of Pool officers absorbed	Percentages
1. Institutions of Higher Education(other than Medical)	1360	36.5
2. Hospitals and Medical Colleges	686	18.4
3. CSIR Organisations	306	8.2
4. other R & D Organisations	485	13
5. Industrial Orgns. (Public Sector)	290	7.8
6. Industiral Orgns. (Private Sector)	345	9.3
7. Defence Organisations	66	1.8
8. Government Departments	126	3.4
9. Self Employed	61	1.6
Total	3725	100

Source : Technical Manpower Bulletin, CSIR
February-March, 1984, Vol.XXVI, Nos.2,3

It is thus, seen that on an average 295 S&T personnel have joined the pool every year during the period 1959-91. If 80% of them are taken to have come from abroad after some years of education and training, as the analysis of data till 1983 shows, 236 return migrants have joined the pool every year, on the average. Though Scientists Pool is not the only channel of return migration nor is it compulsory for

returning hqm to register themselves, on the basis of this observable trend it can be stated that the rate of return migration has been low for hqm. Especially, the pool scheme has not been very successful in attracting the hqm for permanent return. It has, at the most worked as shelter against unemployment and provided the security and confidence to them who decide to return due to whatsoever reasons.

7.3. POLICIES AND TRENDS RELATED TO TAPPING AND USE OF MIGRATING HQM SETTLED ABROAD

Two schemes are identifiable, meant to use the talent and expertise of Indian scientific and technical personnel settled abroad for specific needs and purposes for short periods of time, without any commitment to return to India permanently.

These two schemes are:

(i) TOKTEN (Transfer of Knowledge through Expatriate Nationals), and

(ii) INRIST (Interface for NRI Scientists and Technologists).

(i) **TOKTEN:** India is not unique as far as migration of talented and skilled personnel to developed countries is concerned and many other developing countries are also witnessing this phenomenon. With a view to utilise these talented personnel in various fields, the United Nations and certain developing countries made efforts to develop some programmes. TOKTEN is one such important programme started by United Nations Development Programme (UNDP) in more than thirty countries, in which India is a participating country. This in operation in India since 1980.

Under this programme, distinguished scientists, technologists and other professionals of high caliber are encouraged to undertake short-term assignments in the country of their origin on a voluntary basis. The Council of Scientific and Industrial Research (CSIR) is the implementing agency of the project in India. Distinguished expatriate nationals of Indian origin, mainly in the field of science, technology, medicine and management are invited for a period of 4 to 12 weeks each, to provide specific technical inputs to Research and Development, academic and industrial enterprises - both public and private. Each TOKTEN consultancy assignment is expected to contribute to well defined projects and programmes, in one or

two organisations, towards India's developmental endeavors which may lead to transfer of knowledge, special skills, new techniques, laboratory procedures, development of products and processes etc. The visits are not meant to be utilized for merely giving seminars or lectures or general discussions.

Consultants are selected by an inter-ministerial expert committee after scrutinising the bio-data of the candidates and the requirements of the organisations in the light of National priorities. The selected consultants and the identified host organisation or organisations are expected to get in touch with each other so that the consultants get to know the needs and expectations in advance and can get on to the job immediately on their arrival in India.

The visiting consultants and the host institutions are required to submit detailed technical reports on the work done, the proposed line of action for future, the nature of follow-up activities contemplated, maintaining of long-term relationship and linkage, etc. It is expected that after return to the country of their residence, the consultants would maintain contacts with the host organisations and keep providing the necessary inputs with a view to steer the work initiated by them to successful condition.

The consultants' international and internal travel fare and the per day subsistence allowance during the period of assignment are paid at UN rates are met by the UNDP office at New Delhi on the basis of CSIR's itinerary. The actual consultancy is free of cost.

TOKTEN programme has been implemented in India in some phases. The three phases namely Phase One (1980-82), Phase Two (1984-89) and Phase Three (January 1990 to June 1991) have been completed. The Fourth Phase was started in July 1991 and was about to be over in June 1993. It, however, was given an extension upto March 1994. Before commenting on the trends of available information regarding inflow of experts, it is necessary to point out that the scheme was limited only to experts and not every highly qualified Indian migrant settled abroad. The process of selection etc. has been discussed in the previous section.

TABLE 7.7

NUMBER OF NRI SCIENTISTS AND TECHNOLOGISTS REGISTERED AND VISITED UNDER TOKTEN PROJECT (1980-91)

Year	Number Registered	Number visited
1980	270	2
1981	238	24
1982	94	25
1983	n.a.	3
1984	124	n.a.
1985	143	34
1986	187	51
1987	90	44
1988	103	39
1989	110	35
1990	87	69
1991*	n.a.	5
Total	1446	331

Notes:

* only those who visited in early months of 1991 and not total.

n.a. = not available

Total of numbers is a simple addition of all the available data

Source : A K Sharma; An indepth evaluation of the TOKTEN - INDIA Project 1980-1990, UNDP, 1990 and TOKTEN-INDIA Newsletter, October 1991 - CSIR

In the twelve year period of 1980-92, a total of 331 experts visited Indian (Table 7.7). More than 80% of these experts came from the US and around 11 percent came from Canada. All the European countries put together supplied less than 10% of total number of these experts(Table 7.8). The largest number of experts belonged to the field of engineering and technology. Experts from physical sciences and engineering and technology together formed around 43% of this total (Table 7.9). In every area, the largest number of experts came from the U.S.

TABLE 7.8

FLOW OF TOKTEN CONSULTANTS BY COUNTRY OF PRESENT RESIDENCE
(1988-91)

Country of Residence	Total Number	Percentage
Australia	3	0.9
Bahamas	1	0.3
Belgium	1	0.3
Brazil	1	0.3
Canada	36	10.9
France	4	1.2
Germeny	2	0.6
Ireland	1	0.3
Italy	1	0.3
The Netherlands	1	0.3
Norway	1	0.3
Sweden	3	0.9
U.K.	9	2.7
U.S.A.	267	80.7
Total	331	100

Source : TOKEN INDIA Newsletter
Number 2, October 1991, CSIR.

TABLE 7.9

DISTRIBUTION OF TOKTEN EXPERTS BY FIELD OF SPECIALISATION AND BY COUNTRY OF RESIDENCE(1980-91)

Present Residence/ Specialisation	Country of Residence					
	USA	CANADA	UK	OTHER COUNTRIES	TOTAL	%
BIOLOGICAL & MEDICAL SCIENCES						
Biochemistry	36	4	2	2	44	
Biomaterials	1	-	-	-	1	
Biology	4	1	-	-	5	
Biophysics	2	-	-	-	2	
Medicine	5	-	-	-	5	
Pharmacology	4	-	-	-	4	
Sub Total	52	5	2	2	61	18.4
PHYSICAL SCIENCES						
Chemistry	6	-	-	2	8	
Geosciences	1	-	-	-	1	
Mathematics	2	-	-	-	2	
Physics	10	1	2	3	16	
Sub Total	19	1	2	5	27	8.4

CONTD...

TABLE 7.9, CONTINUATION.

ENGINEERING & TECHNOLOGY

Aeronautical Engg	1	1	-	-	2	
Architecture	-	-	-	1	1	
Chemical Engg	13	2	-	-	15	
Civil Engg	5	2	1	-	8	
Structural Engg	3	-	-	-	3	
Electronics	4	-	-	-	4	
Electrical Engg	18	5	-	1	24	
Environmental Engg	1	-	-	-	1	
Geotechnical Engg	1	-	-	-	1	
Industrial Engg	2	-	-	-	2	
Transportaion Engg	1	-	-	-	1	
Industrial Engg & Mgmt	1	-	-	-	1	
Materials Engg	1	-	-	-	1	
Materials Science	12	-	-	-	12	
Mechanical Engg	11	1	1	-	13	
Metallurgy	6	-	-	2	8	
Microwave Engg	1	-	-	-	1	
Mineral Processing	1	-	-	-	1	
Mining Engg	5	2	-	1	8	
Stastical Mechanics	1	-	-	-	1	
Pharmaceutical Tech	1	-	-	-	1	
Telecommunications	1	-	-	-	1	
Sub Total	90	13	2	5	110	33.2
Others	106	17	3	7	133	40.2
GRAND TOTAL	267	36	9	19	331	100.2
%	80.7	10.9	2.7	5.7	100	

Source : TOKEN-India Newsletter October 1991, Number 2

Note : Percentages were calculated on the basis of given data.

More than three fourths of these TOKTEN consultants were affiliated to either Academic or Research and Development institutions in their countries of residence (Table 7.10). Here in India, they mainly worked for the entire R & D system of the country, including CSIR and other national laboratories. They also worked for some of the Government organisations, public sector and several selected industries (Table 7.11). University and educational institutions hosted around one third of the consultancies by these experts.

TABLE 7.10

INSTITUTIONAL AFFILIATION OF TOKTEN EXPERTS

(1980-90)

Inistitutional Affliation	Total Number	Percentage
Academic	153	56.7
Industry	46	17
R & D	56	20.7
Others	15	5.6
Total	270	100

Source : A K Sharma(Chairman),; An Indepth Evaluation of the TOKEN-India Project, 1980-90; UNDP, October 1990

The average duration of stay each expert during the period 1980-90 turns out to be 4.8 weeks (Table 7.12). During the first phase of TOKTEN programme, the duration of visits were short-one to six weeks. During the next two phases, the most common periods of stay were four to six weeks. During these brief period of consultancy visits, hardly any significant work involving transfer of knowledge or know-how can easily be completed. The projects, however, envisaged the visits to be of catalystic nature leading to continuing contacts with host organisations or scientific and technical problems of mutual

interest and possible development of collaborative projects. In this context, the information given in Table 7.13 and 7.14 become relevant. They are based on survey results done on both host organisations and visiting consultants. Majority of the organisations seemed fairly satisfied with the nature of contribution in the main activities undertaken during consultancy. Majority of them were also interested in future assistance within TOKTEN programme. Most of the organisations also felt that the work was done more or less according to the plan and the experts also had the similar perception regarding this. However, on the question of follow up activities being undertaken, 73% of experts said yes whereas only 67% of organisations said so. Most of the experts also perceived the institutional arrangements, work relationship and receptivity of the host organisations to be good. Though majority of the visiting consultants felt that their being Indian made them more acceptable, a good 28% felt it made no difference.

TABLE 7.11

DISTRIBUTION OF TOKTEN CONSULTANTS BY HOST INSTITUTIONAL GROUPS
(1980-90)

Host Institution Group	Number of Institutions benefitted		Number of Consultanties	
		(%)		(%)
1. CSIR	33	17.7	264	34
2. Government Deptts/Orgns	15	8.1	20	2.6
3. Hospitals	3	1.6	3	0.4
4. Other R&D Orgns.	51	27.4	138	17.8
5. Industrial Units	36	19.4	89	11.5
6. Universities & Educational Institutions	48	25.8	262	33.8
Total	186	100	776	100

Source : A K Sharma(Chairman),; An Indepth Evaluation of the TOKEN-India Project, 1980-90; UNDP, October 1990.

TABLE 7.12

DISTRIBUTION OF TOKTEN EXPERTS ACCORDING TO DURATION OF VISITS
(1980-90)

Week	1980	1981	1982	1985	1986	1987	1988	1989	1990	Total
One		4	7		2					13
Three	1	5	7	6	6	4	1	1	1	32
Four	1	3	11	19	16	18	16	17	5	106
Five			2	4	16	6	7	5	3	43
Six		3	4	4	4	4	8	5	4	36
Seven				2	4	4	1			11
Eight			2		1	7	5	4		19
Nine					1			1		2
Ten			1							1
Eleven								1		1
Twelve & above		1	2			1	1	1		6
Total	2	16	36	35	50	44	39	35	13	270

Source : A K Sharma(Chairman),; An Indepth Evaluation of the TOKEN-India Project, 1980-90; UNDP, October 1990.

TABLE 7.13

HOST INSTITUTIONS EVALUATION OF TOKTEN CONSULTANCY (1980-90)

	Yes	No	Not Mentioned
Did you have correspondence with the experts before the visit regarding the problem to be handled	190	42	1

	Fully	Partly	No	Not Mentioned
Was a detailed work plan prepared before start of consultancy	91	112	29	1
Was work according to original plan	131	72	29	1

	Nature of contribution			
	Excellent	Good	Fair	Not Mentioned
Main activities undertaken during the visit				
(i) Transfer of New Knowledge/Technique	71	103	15	-
(ii) Seminar/Lectures	141	71	5	1
(iii) Advice on future projects	60	109	19	1
(iv) Consultation on current activity	71	104	22	1
(v) Others	13	10	-	1

	Yes	No	Not Mentioned
Are any follow up activities being undertaken by you	158	63	12
Would you be interested in future assistance under TOKTEN	210	14	9

	Same Orgn.	Other Orgn.	Not Mentioned	No
Recommendation for revisit of the Consultants	77	46	102	8

(Evaluation performance of 233 host organisations were analysed)

Source : A K Sharma(Chairman),; An Indepth Evaluation of the TOKEN-India Project, 1980-90; UNDP, October 1990.

TABLE 7.14

TOKTEN EXPERTS EVALUATION OF THEIR ASSIGNMENT
(Evaluation performance of 186 experts analysed)
(1980-90)

	Fully	Partly	Not at all	Not Mentioned
Was detailed work plan prepared before start of the consultancy	95	68	19	4
Was work according to the original plan	118	54	9	5
	Excellent	**Good**	**Fair**	**Not Mentioned**
Institutional Arrangements	132	41	10	3
Working relationship between you and your counterparts in the organisation(s) were	148	27	7	4
Receptivity of the Host Organisation(s) to new ideas	135	38	12	1
	More Acceptable	**Same**	**Less Acceptabl**	**Not Mentioned**
Being of your Indian origin & language, your approach can be rated as(compared to similar assignment)	127	53	1	5
	Yes	**No**	**Not Mentioned**	
Follow up activities being undertaken	136	44	6	

Note: Total responses received - 186

Source : A K Sharma(Chairman),; An Indepth Evaluation of the TOKEN-India Project, 1980-90; UNDP, October 1990.

The most important questions emerges about these consultancies is concerning their cost. Table 7.15 shows that the average cost per consultant during the period 1980-90 has varied between US $3043 and $6229. According to this estimate, the average cost per week varied between US $672 and $1466 during the same period. It is not clear from the available information whether this is total cost or this includes particular kinds of expenditure. Since actual consultancy is supposed to be free of cost, all the expenses cover only the real expenditure like travel, stay etc. and a daily allowance. The UNDP provides funds for these expenditures. Three questions become important here - one, whether these consultancies are cheaper compared to the similar consultancies through market, two, are they contributing substantially to the required areas in which development is needed and required expertise is not available, and third, whether the government or host organisations will be able to continue to afford such consultancies in due course of time. With the help of available evidence, no definite replies can be given for any of these questions. The Evaluation Committee of the UNDP observes that:

> The cost effectiveness of the TOKTEN project vis-a-vis comparable consultancy programme involving experts from abroad, need hardly to the emphasised(Sharma, 1990)

This observation, however, is not substantiated by any corroborative evidences and cannot be taken as definitive. This can be taken, at the most, as an indicative fact. The UNDP provided US $191,522 for Phase i, $925,000 for Phase II and $500,000 for Phase III(amount for Phase IV is not available). The experts are being paid in foreign currency at UNDP rates. Even if the costs are accepted to be comparatively less, they are quite high for a country like India, especially in terms of foreign exchange.

Here it may be pointed out that there has always been a fallacy in calculating the cost effectiveness of any aid by Government of India. It generally happens that aid coming from any foreign country or international agency for any purpose is treated as free of cost. However, since most of the aid can have alternative uses, the real cost of any programme, for example, TOKTEN, is the best alternative programme that could have financed with the same money.

TABLE 7.15

COST OF CONSULTANCY FOR TOKTEN PROGRAMME
(1980-90)

	Number of Consultants	Number of weeks spent	Amount spent($) (in US $)	Cost per week($) (in US $)	Cost per Consultant (in US $)
1980	2	7	10260	1466	5130
1981	16	65	74740	1150	4671
1982	36	163	109540	672	3043
1985	35	152	115484	760	3300
1986	50	235	225001	995	4500
1987	44	249	274082	1101	6229
1988	39	209	192973	923	4948
1989	35	190	191458	1008	5470
1990	13	62	65000	1048	5000
Total	270	1332	1258538	945	4661

Source : A K Sharma(Chairman),; An Indepth Evaluation of the TOKEN-India Project, 1980-90; UNDP, October 1990.

In this context it also becomes important to know whether such visits are serving the purpose of compensating the loss of human capital caused by migration of hqm. Host institutions seem to be satisfied with the nature of work and hence the reply to this question can be taken as affirmative. But the real effectiveness of such programmes can be assessed only in terms of changes which take place in Research laboratories and other places where these experts visit. It is not very likely that a visit of this kind in itself would have any such impact of great significance. However, the available evidences suggest that they are serving that purpose, though to a very limited extent, especially because the cost is being borne by an UN organisation.

Actually, , the scheme can also be seen in the light of much discussed proposal of Bhagwati regarding brain-drain related taxation. Though there is no element of taxation in the financing of TOKTEN programme either of migrating hqm or of Developed Countries, an equation can be drawn on the basis of some of the elements. The proposal included taxing the hqm immigrants to developed countries, adding the contribution of a matching amount by Developed Countries who benefited by such immigration and then the routing of these proceeds through an UN organisation to either Less Developed Countries (LDC) of origin or LDCs in general for investment in developmental efforts of those countries. The rationale behind the whole proposal obviously lied in the principle of compensating the developing countries for their loss caused by the migration of hqm to developed countries.[53]

The rationale for TOKTEN programme is also to provide some help to developing countries in their development efforts through their own hqm who had emigrated. To the extent, the developing countries are not paying for the expert consultancies, they are gaining financially also. Since there is no consultancy fee within this scheme, the experts are losing that amount, which they would have made through such services. The functional costs are being borne by the UNDP, whose main resources come from developed countries. In this way, there is some equation between the two - TOKTEN and Bhagwati's proposition, though crucial element of compulsion is missing in the whole scheme. Probably political, legal and administrative problems associated with the proposal of brain drain tax make it less acceptable and a programme like TOKTEN more acceptable to both migrating hqm and developed countries. In fact, since there is no element of compulsion, there is no binding for the emigrants to participate. Similarly, it does not cost anything extra directly to developed countries. Hence, on the whole, it can be stated that the TOKTEN programme can be seen in the light of compensatory tax proposal even though it does not contain the basic essence of that proposal.

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53. See "Taxing the Brain Drain : A Proposal" edited by Jagdish N. Bhagawati and Martin Pantington; North Holland Publishing Company, New York, 1976, for the disucssion on various aspects of this proposal in detail.

(ii) INRIST The Government of India, through the Council of Scientific and Industrial Research, has established in early 1990 a Centre for Interface for NRI Scientists and Technologists. The main functions of the INRIST centre are to act as a focal point of contact in India to establish linkages of NRIs with Indian organisations and also to interact with various institutional and voluntary organisations abroad on one hand and all scientific, technical and economic departments of Central Government as well as State Governments and Industries on the other. The basic objective is to ensure effective utilisation of NRI expertise. INRIST also interacts with private industries. The INRIST centre is also responsible for UNDP funded TOKTEN project. The aim of the centre is to mobilise NRI expertise and resources to promote research and development activities in various important areas, set up facilities of important nature to support selected projects as per policy of the Government and also establish joint venture projects in key areas.

The establishment of INRIST centre and nature of TOKTEN programme make it clear that lately the emphasis of Indian Government's policy has been on utilisation of NRI's talent and expertise, which they have experienced during their stay abroad, for country's development needs, without disturbing their individual decisions to continue living abroad. Though several facilities are available to those who decide to return, these schemes are there mainly to give a sense of security rather than to work as an incentive. The Government either does not seem to recognize the migration of hqm as brain-drain or if it does, it has failed to come out with a comprehensive set of policies and programmes for controlling or discouraging out migration, as reflected in the absence of any intervention. It is quite probable that the Government recognizes the drain but does not intervene for aforementioned reasons - democratic values and importance of foreign education and training. The current emphasis on tapping of emigrated personnel talents and expertise also reflect these values.

7.4 SURVEY OF IIT MIGRANTS: RESULTS REGARDING INFLOWS OF HUMAN CAPITAL.LS2

7.4.1 **PLANS REGARDING RETURNING TO INDIA** Chart 7.1 shows that initially 90% of the migrants surveyed had planned to return immediately after finishing their studies. Only the remaining 10 percent had planned not to come back from the very beginning. Though all those belonging to 90% changed their plan and decided to continue their stay abroad, 90 percent of them still want to come back at some stage and only 10 percent have decided not to come back ever. In fact, 8.5 percent of this 90 percent have been trying to build some footage in India - mainly in business - which have not been successful so far in anybody's case. Details of their efforts and the reasons for failures have been discussed in chapter V.

CHART 7.1

IIT MIGRANTS: PLANS REGARDING RETURNING TO INDIA

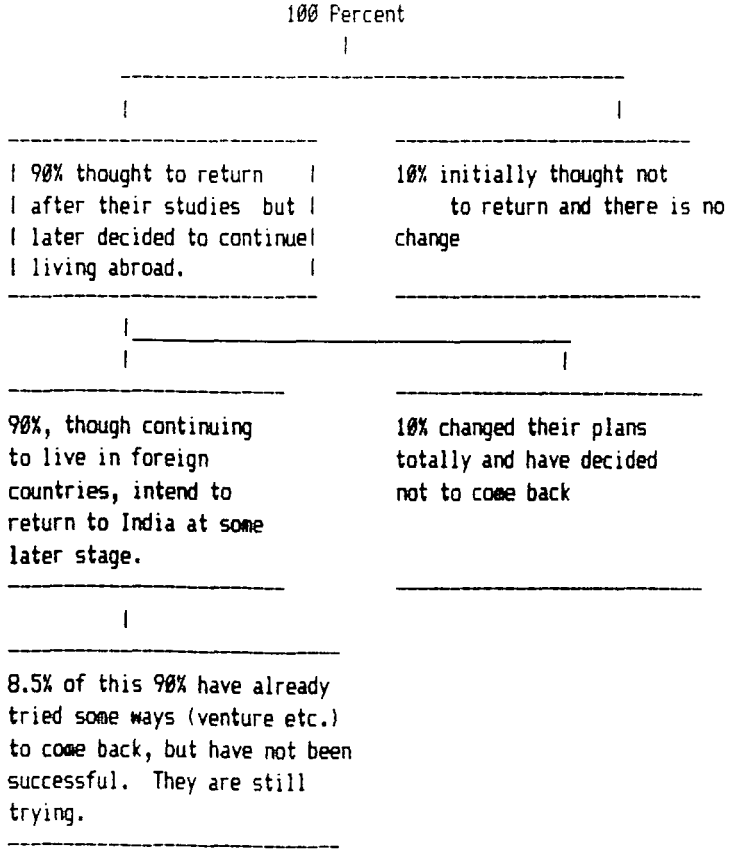

TABLE 7.16

INFLOW OF HUMAN CAPITAL THROUGH IIT EMIGRANTS SETTLED ABROAD

	Profession							
	Academics and R & D Organisations		Industry		Self-Employment		Total	%
	Number	%	Number	%	Number	%		
1. Some Relation	44	66	7	19	7	100	58	52.7
2. Not till then but but planned to have some in future	11	17	2	5	0	0	13	11.8
3. No relation and plan to do so in future	11	17	28	76	0	0	39	35.5
Total	66	100	37	100	7		110	100

TRENDS IN INFLOW OF HUMAN CAPITAL THROUGH IIT MIGRANTS

In the survey of IIT migrants settled abroad, they were asked whether they contributed to India's development efforts in any form through their profession. 56% of all respondents replied in affirmative while 35.5% said a specific no. Another 12% had no relation till they responded but had some concrete plans to do so in future(Table 7.16). However, it is important to point out what do they mean by having some relation with the home country through their profession. For those in academics and R & D institutions, it mainly meant participation in a joint project or workshop, etc. For those in industry, it meant working in their company in some joint venture relating to India. For those who were self employed, there was something more tangible in it. All those who were self employed having some business or consultancy centres had made some investments in India. In most cases they had opened centres for data base in India, though varying in their size and area. Invariably it also meant employing some people in India. Some of these cases have been discussed in detail in chapter V.

On the whole, as evidenced by these trends, there does not seem to be any significant inflow of human capital either in form of permanent return migration or in forms of temporary consultancy services. Though certain schemes have helped in utilizing the technological expertise of expatriates, the number of such consultancies are too small compared to the number of those hqm who migrate everywhere. The IIT survey also reinforces the trend in sense that they have also not done much on the line. However, this survey showed that there are possibilities of tapping their experience and training if the policies are guided towards right direction.

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CHAP VIII

SUMMARY AND CONCLUSIONS

In the preceding chapters, we have presented an account and analysis of issues and evidences relating to international migration of highly qualified manpower from India, with a special reference to migration of engineers and scientists educated at Indian Institutes of Technology. Certain important conclusions can be arrived at, with the inferences of the study - a few of them having policy implications too. This chapter summarizes the whole study and outlines the conclusions.

The Indian Institutes of Technology were started with certain defined aims and objectives which gave them special status and meaning, and also specific tasks to fulfill. After independence, the cause of technological and scientific self-reliance was taken with great seriousness. The strong emphasis on industrialisation in second five year plan reflected a policy of technological self reliance implying development of India's own scientists and engineers for design, development, research and teaching. The scientific policy resolution passed in 1958 made the importance of developing scientific and technical manpower of very good quality more explicit. The IITs were established in late 1950s and early 1960s in pursuance of this policy. With huge capital investments, efforts were made to provide very good facilities in all spheres viz., faculty, laboratory, library etc., to enable the production of scientists and technologists of highest order who could compete with Western experts. This is reflected in the wide gap existing between expenditures in IITs and other general engineering colleges.

Within IITs, per student expenditure for post-graduate students is higher compared to under-graduate students, mainly due to lower teacher student ratio, and large number and high amounts of scholarships. The share of institutional expenditure which included expenditure on pay, allowances and working expenses of teaching departments, laboratories and workshops, scholarships, expenditure on library, hostel etc and also a part of expenditure on establishment, estate and security, and excluded mainly the municipal and other functions not considered necessary for institutional purpose, was higher for post-graduate students as compared to under-graduate students.

The grants coming through the central government has always been the main source of financing for IITs, bearing around 90 percent of all recurring expenditure. The rest comes through various sources like fees and other charges collected from students, rent, electricity and water charges from staff, application fee for posts, fines, sale of tenders, computer charges, consultancy fees, sale of unserviceable items etc. Interestingly enough, the share of income coming from students under various heads has gone down from 6.8 percent to 1.3 percent of total recurring expenditure during the period between 1968-69 and 1984-85, and that from other sources has gone up. This obviously reflects the somewhat inelastic structure of fees of various kinds. The private opportunity cost of IIT migrants, defined as the value of alternatives of other opportunities which have to be foregone in order to study at IIT, seems to be either nil or negligible, when taken as a whole. This is explained mainly by the fact that most of those who enter IIT are bright students and generally have the alternatives of admission in some other technical colleges costing roughly the same, as is borne out by the Survey of migrants. Actually, this has been the focus of discussion in recent past as the low share of private costs and high share of social costs has been questioned in view of two issues - one is the current phase of resource crunch for education sector and the other is the privatisation of benefits, especially for those who migrate to developed countries.

The above findings confirm our first hypothesis that the share of social costs is very high in IITs which means this leads to an increase in the losses associated with migration of IIT graduates. However, high social costs are incurred in IIT mainly due to two reasons - (i) higher salary structure of their staff - both academic and non-academic, and (ii) higher expenditure on academic facilities like laboratory, library etc. These coupled with low student-teacher ratio make the per student expenditure very high. These staff, however, must be paying taxes based on their salaries. The academic facilities also remain there to be used for other income generating purposes like consultancy or to be used for training of faculty member of other engineering colleges. This means, students are not the only beneficiaries of high social costs. Hence higher component of social costs in case of IIT migrants may not mean the difference between them and those who have been trained at some other general institutions is by the amount of difference in the social costs as visible in the expenditure trends.

On an average, the annual rate of migration can be put at around 30 percent on the basis of various studies. The rate seems to be roughly the same for engineers and scientists. Certain interesting features relating to IIT migrants have been revealed by our survey. United States is the main destination for more than 90 percent of IIT migrants. The indicators showing socio-economic background reveal that though majority of them comes from educated, city-based, middle-class families, around 1/4 of them, however, also comes from small town-based, uneducated or lowly educated, lower or lower middle-class families. But, hardly any one comes from rural background. An interesting characteristic about migrants was high level of education among their mothers considering the low level of literacy rate among Indian women especially during the period of 1960s and 70s. Only 22 percent of the mothers of these migrants had had no formal schooling, the rest were educated upto high school and above. In fact, 50 percent of them had education upto the level of graduation or above. Preponderance of metropolitan background was another remarkable feature. However, stay and study at IIT seems to have negated the disadvantages associated with lowly educated, lower middle-class background as far as information and capability relating to migration are concerned.

Quite interestingly, 60% of the IIT migrants considered the phenomenon of their migration to a foreign country, a drain involving financial and economic losses for their country in terms of social cost as well as future development. However, 36 percent considered this as a gain for India in terms of finances and human capital and a meagre 4 percent considered this of no consequence for the country of emigration.

While discussing the phenomenon of international migration from IITs in the context of their establishment and social costs we have also tried to examine the role of foreign aid which had a substantial share in bearing capital costs of establishing IITs. The aid came mainly from the USSR, the United States, the Federal Republic of Germany and the United Kingdom for IIT Bombay, IIT Kanpur, IIT Madras and IIT Delhi respectively. The IIT Kharagpur was established without any foreign aid though it got some aid from foreign countries at later stages. Foreign aid came mainly in three forms - (i) money for equip-

ment; (ii) foreign experts as faculty members, and (iii) training of Indian faculty members abroad. The amount of aid, though substantial, was less than half of total initial capital expenditure. The remaining share coming from the Indian Government. There were also several conditions attached with these foreign aids which created some problems, and undermined their value, as discussed in Chapter III. For example, IIT Bombay, IIT Kharagpur and IIT Delhi had a lot of problems relating to spares. IIT Delhi could buy equipment only from UK. IIT Bombay had to face the problem of obsolete and unsuitable equipment. IIT Madras and IIT Kanpur faced least problems in this regard. There were certain limitations in choice of faculty members also, especially in respect of those who came from abroad.

Involvement of foreign experts as well as training of Indian faculty members abroad gave the curricula a Western approach. It was, to a certain extent unavoidable since IITs were established as centers of excellence of Western science and technology. However, what made the situation bad was exclusion of courses on Indian socio-economic realities and efforts to mould the Western science accordingly. The undermining of social sciences and humanities in IIT curricula and less flexibility within the courses made the whole education more theoretical and Western oriented which alienated it both from Indian social and shop-floor realities.

Two clear conclusions have emerged regarding the role of foreign aid in establishment and growth of IITs and resultant effects on economy as a whole: (i) given the facts (a)that having already chosen the Western model of development based on modern science and technology, India needed to develop its scientific manpower of high quality at a fast rate, (b)that movement of technology was not subject to open market or free trade situation, (c)that India did not have the kind of capital resources required to buy the needed technologies, and (d) that a substantial percentage of IIT graduates was working within the country; the choice of foreign aid for establishment of IITs, was inevitable, and (ii) foreign aid expedited the process of establishing IITs and developing manpower. But, the advantages associated were certainly limited by the conditionalities attached mainly in the form of limiting the choice of equipment and faculty as well as the problem of spares. In the long run, the aid can be said to have diluted the benefits by developing a curricula somewhat alienated from Indian social and economic contexts contributing, though indirectly, to high rate of migration.

Indian faculty members and administrators are also responsible, however, for not developing the curricula development on a desirable line. On the whole, foreign aid in the context of IITs, played a positive role compared to no aid situation but the benefits were not well commensurate with the amounts involved. The above analysis confirmed our second hypothesis that establishment of IITs with the help of foreign aid was a right decision as it helped in producing high quality HQM for the country at a fast rate, despite high rates of international migration of their graduates.

The developed countries, especially the United States, have certainly benefited from the immigration of IIT professionals. But how far this can be linked to the deliberate policy of providing foreign aid, has not been investigated as our main concern has been to assess India's losses and benefits.

The phenomenon of international migration takes place due to certain demand supply interactions. In modern days, besides existence of certain differentials in terms of income, wage rate and opportunities, what assumes importance in this context, is policy relating to immigration and emigration. The analysis of immigration policy of the US, the main receiving country for Indian emigrating scientists and engineers, suggested that it has been welcoming towards Indian professionals during the later half of this century. The size of migration from India to US has been determined by and large by the quota set out by US immigration policy and exemptions allowed. The immigration policy has been explicitly or implicitly reflecting the labour market needs of the American economy. Indian professionals have entered the US under visa for professional as well as other preferences during 1965-1990 period. Quite a good percentage of those entering under family preferences was highly educated and joined labour force - a fact not so explicitly shown by the data. Besides, a number of professionals first enter as non-immigrants and later change their status to that of immigrants. They are counted in the immigration data only after change of status.

The survey of IIT migrants also showed that 93 percent of them went to USA on student visa and only after five to ten years changed their status to that of immigrant, lending credence to the observation that data relating to brain drain needs to be redefined. Also, a small percentage(2.7%) came as immigrants on family preference, showing the use of this channel by professionals, especially women. The rest of IIT migrants were equally divided between exchange visa and temporary workers visa.

The 1990 Immigration Act of USA has further liberalised the immigration, especially for those who are highly trained and educated. Total limit, coming under quota, has been increased to around 25000 per year from 20000 per year and exemptions from this limit continue for several categories of relatives of immigrants and citizens. With increased emphasis on employment based immigration, it is expected that the number of immigrants in this category would rise by two to three times - having serious implications for migration of highly trained professional from India and other Asian countries. The number of family preference visas are more or less retained with a slight increase. A new category of visas for investors investing in the US economy and guaranteeing some employment would also be used by non immigrants to change their status to that of immigrants.

The immigration policy of USA has reflected the labour market needs, and labour market trends show a gap of required skills and existing supply within USA. Occupation related data, as discussed earlier, show that professional speciality was one of the fastest growing occupation between 1960-1990 period. Hihgly trained Indian professionals come under this occupation category. This was also seen that the foreign born Americans occupied larger than average part of this occupation group. Besides, a look at scenario of job rated training and education reveal the wide gap existing during the period, which means the US needed to fill the gap through immigration. The future projections showed the continuation of growth of certain occupational categories including professional speciality and managerial jobs and a shortage of those skills as well within the US, despite increase in level of education. As such, going by labour market projections and liberalised American immigration policy, it can easily be inferred that demand for Indian professionals will grow even more in the future. As the desire to go to the US always exists among Indian HQM due to differentials in salary, living standard, opportunity, etc., this would certainly raise the brain emigration from India. The analysis of American immigration policy and job

market from the point of view of their implications for Indian HQM immigration confirmed the third hypothesis that these demand side factors mainly determine the size and nature of immigrating HQM. The high place of Indians in the US job market, as reflected by their high labour force participation, high share in esteemed professions, high level of education and low reliance on public assistance, showed their wide acceptability in the US society. More than 60 percent of IIT migrants were settled in either academics or research and development, showing their suitability to that type of job. 33 percent were in private sector firms or financial institutions. Remaining 6 percent had taken to self employment. Average level of income for an IIT migrant settled in the US, who had joined the work force, was roughly US $70000 per annum in 1991 which is much higher than the average for such professionals there. Regarding their treatment in USA, most of the migrants who were at early or middle level of their career, felt satisfied while those at higher level felt slightly discriminated against. However, in general they felt that they are widely accepted and respected for their high calibre as well as hard working attitude.

The high place of Indians in the US economy in general and IIT migrants in particular confirms the fourth hypothesis that the emigrating Indian HQM is of a high quality and it can compete well in the international market.

On the question of having some links with Indian economy, IIT migrants supplied some very interesting information some of which have been presented in Chapter IV. There are several cases where these IIT migrants tried to invest in India in their area of speciality for example, a computer professional investing in a database centre, but were not successful mainly due to vested interests role and lack of infrastructure. There are others who want to make investments in future in various fields, such as biotechnology, data base centre, etc, but lack of infrastructure is dissuading them from doing so.

Some cases have shown that IIT migrants working at higher levels in the US firms have been using Indian consultants from India. One of the respondents settled in Middle East imports Indian components and uses Indian labour for his company. Some other cases showed the interest of a few IIT migrants in India's rural development. They send remittances to some voluntary organisations working for betterment

of some deprived section or for some other work on sustainable development. Besides, two migrants, who have returned after long years of stay in developed countries, seemed quite keen to relate to Indian economy and development in some manner. They feel that at a later stage, many migrants may want to come provided there lies an opportunity. These evidences suggested that emigrated Indian HQM want to develop some links with Indian economy conforming our fifth hypothesis.

From the supply side, the study showed that there is no specific policy intervention from the Indian Government to stop or prevent migration of HQM to developed countries. Nor is there any explicit public finance intervention to dissuade them from going or to compensate the outflow of associated finances borne in the form of social cost. This kind of non-interventionist policy as explained earlier can have two probable explanations - (i) democratic nature of Indian politics and society, and (ii) the importance attached to foreign training and education by the society as well as by the Government. We have seen in IIT survey that in most cases they first go for their studies abroad and spend several years as student. They usually leave the country in the same year they graduate from IIT. This means they look at the education abroad as continuation of their studies. They join labour force only after 4 to 7 years of additional education in those countries. This means more value is added to their human capital content by that economy. This value addition adds further to their saleability as well as to the price in the labour market.

On the other hand, India has an elaborate system of schemes involving financial inflows coming from Non Resident Indians(NRIs). The definition of an NRI for banking purpose is very broad which includes Indian citizens working abroad and also persons of Indian origin . Besides, barring a few, most of the facilities available to NRIs are also available to overseas corporate bodies owned directly by Indian nationals or persons of Indian origin to the extent of 60 percent. The definition of NRI for taxation purpose is much narrower in comparison. This implies that India wants to attract foreign exchange through banking channel from a large number of people, treating them as NRIs but does not want to bring all of them under purview of taxation.

Three types of financial inflows are associated with NRIs - (a) Remittances, (b) Bank Accounts, (c) direct investment. As for remittances, the study showed that India has no policy to sustain or increase inflows. There is no obligation for migrant workers or their foreign employers to remit any part of their earnings to India. Nor does there exist any premium on exchange rate. The only regulation is that remittances should be channeled through official means and in case of permanent return, migrants can bring the foreign exchange and open Resident Foreign Currency Accounts (RFC), maintainable in any foreign currency. The liberalised system of RFC is a current introduction having been started in 1992, replacing the earlier schemes which were more rigid about repatriation of such money. The introduction of unified exchange rate in 1993-94, has helped in removing the implicit tax on remittances, as there existed a difference of about 25 percent between market and official exchange rate, the former being higher, and the regulation permitted only 40 percent of the earnings to be converted at market rate. In fact, before 1992-93, when this system of partial convertibility was introduced, there generally existed a high premium in illegal channels over the official exchange rate, making use of official channels unattractive.

Unlike remittances, there exist a number of schemes for short to medium term capital flows in shape of various types of bank accounts, as discussed in detail in Chapter VI.. Two of these bank accounts are important, as they can be operated only with remitted money - Non Resident(External) Rupee Accounts (NRE Accounts) and Foreign Currency (Non Resident) Accounts (FCNR). The former can be held only in rupee terms while the latter can be held in any of the four currencies - US dollar, Pound Sterling, Deutsche Mark and Japanese Yen. Money from both the accounts are readily repatriable. The interest rates for NRE accounts are fixed at a higher level than the prevailing domestic exchange rate. However, they cannot exceed the domestic rate of interest for comparable deposits by more than one percent since October 1992. The interest rates for FCNR accounts are determined in accordance with prevailing rates in international market, generally fixed at a higher level than that. Another scheme - Foreign Currency (Bond & Others) Scheme meant for both NRIs and foreign nationals was introduced in 1990 in view of foreign exchange crisis, carrying a very high rate of interest but was withdrawn in July 1992.

We also saw that in recent years, the Government has liberalised the policy of private investment by NRIs by introducing various new schemes, simplifying the procedures and raising the limits. The limits of NRI investments have been raised from 74 percent to 100 percent in industrial ventures in India. Facilities exist for direct investment with both repatriation benefits and without repatriation benefits. NRIs are also allowed to invest in new issues of new and existing companies, upto 40 percent of new capital issue, with full benefits of repatriation, provided it is a manufacturing activity. They can also invest in Government securities. Under the portfolio investment scheme, NRIs are permitted to buy shares of Indian companies through stock exchange with some regulations. A number of measures taken in 1991 Industrial Policy simplified the process of participation in collaborations. Apart from these, the general opening up of the economy and abolition of various regulations including delicensing, etc. have significant relevance for NRI investor also. On the whole, it was found that the emphasis of the policy is more on capital flows - both of short-term and long-term and less on remittances.

Two types of evidences concerning inflow of financial as well as human capital resources have been considered in this study; (i) macro level on the basis of various official sources and (ii) micro level as evident by Survey of IIT migrants. Data relating to remittances separately are not available and hence credits on private transfer payments which mainly consists of remittances are taken as indicative of trends in remittances. These payments have shown a consistent growth over the period 1970-71 and 1990-91, with intermittent periods of stagnation in between, in rupee terms at current price level. These payments had first shown a sudden very high growth during mid-seventies.

An analysis of origin of remittances suggest that during seventies and early eighties the share of skilled and semi skilled workers was higher whereas during late eighties the share of remittances originating from HQM increased. Roughly half of the total remittances seem to have originated through HQM. Certain micro level evidences were collected regarding financial inflows through responses of IIT migrants. It was seen that around 34 percent of IIT migrants do not send any remittances. However, per capital annual remittance for IIT migrants turned out to be US $3373, which is very high compared to

macro level estimate by Nayyar(1994) which suggested a very low rate of per capita remittance originating from H&M in developed countries. This fact assumes great importance as remittances are usually associated with short-term migration of skilled and semi skilled workers.

Not much evidence is available at macro level for utilisation of remittances, especially for H&M. A survey done on utilisation of remittances, set up by Kerala migrants showed that major portion was used for consumption. The IIT survey showed that around three-fourth of recipient families spend the entire amount on consumption and only one eighth of the total recipient families spend 80 to 100 percent of the amount on investment. What is interesting is that about one percent of migrants send remittances for charity purpose - mainly meant for rural development or development of other deprived sections.

The inflows into two important external accounts - NRE and FCNR enter into capital accounts on the balance of payments. The trends observed for these deposits suggested continuous increase in total value of stock during 1975-76 and 1992-93. However, this is not true regarding net inflows which showed a high growth rate during mid 1980s and to end 1980s and a declineafterwards, leading to a net outflow during 1991-92. The following years, however, witnessed a rise in net inflows as well as in stocks. During early phase of late 1970s and early 1980s, the share of NRE accounts was higher whereas during mid and late 1980s FCNR accounts consisted of as high as 80 percent of total amount in these deposits. The dollar account in FCNR scheme showed a high rise during 1984-85 to 1989-90 and fell tremendously thereafter, showing signs of recovery again in 1992-93. The pound sterling account had registered a high growth during two years around mid 1980s after which it stagnated due to net outflows throughout late eighties. In 1991-92, however, it suddenly increased tremendously and the trend continues.

The scheme of FC(B&O) Account collected large sums during he brief period of its stay. Though it was open to foreign nationals also, along with NRIs it is quite probable that NRIs were the main suppliers to it. In fact, the large outflows from FCNR accounts suggest the possibility of some sort of transfer from that to FC(B&O) Account, due to high rate of interest being offered.

A comparison of interest rates for FCNR Accounts with that for international market showed the high degree of responsiveness of flows in FCNR to difference in these rates. Higher the difference between these two rates, larger was the growth rate for inflows into FCNR accounts. NRE Accounts, which did not cover exchange risk, unlike FCNR, was responsive to exchange rate fluctuations in general. But, what is interesting is that despite sharp depreciation in the rupee value and very low difference in the interest rates, as compared to international market rates, inflows in this account remained positive for a long period of time. Both the accounts were sensitive to international perception of credit-worthiness as revealed by decreasing rates during late 1990s.

No countrywise or even regionwise data is available to show the origin of these deposits. It is, however, generally assumed on the basis of high degree of sensitivity and responsiveness that they probably originate from HQM possessing high skill and large resources.

The study also showed that capital flows via NRIs come in the form of direct investment also. There are several ways through which NRIs can invest directly in the Indian economy. Data relating to NRI direct investment are available only for recent past - late 1980s and early 1990s. In fact, only during this period, this vehicle of capital flows has gained greater importance and hence, analysis of this data can help in understanding the trends. Collaboration is one important way of direct investment. The study showed that NRI collaborations have taken the shape of financial collaborations and their share had reached more than 35 percent in 1989 after which it fell to around 12 percent - revealing the similar trend as external accounts.

Countrywise distribution of NRI investments in collaboration showed the United States to be the largest source, followed by Western Europe especially Germany and the UK and Japan. A small proportion also comes from other developing countries. On the whole, this type of investment also seems to be originating almost wholly through emigrating HQM.

As discussed earlier, what is significant about NRI collaboration is that being financial investments they represent long -term interests unlike technological collaboration which involves huge

lumpsum payments and short-term interests. During eighties, India entered into a number of technological collaborations and as such, in most of the years, the amount of lumpsum payments exceeded the total amount of financial investments as shown in Chapter VI. Data are not available regarding profits and dividends remitted to NRIs on their investments and hence no comparison of inflows and outflows in this sense could be made.

Total direct investment by NRIs, including directly issued Non-Convertible debentures and advance shares showed a high growth in terms of stock over the period 1986-87 to 1992-93. The inflows also have registered a sharp growth especially for repatriable schemes. This increase seemed to have taken place mainly due to increase in investments in advance shares and non-convertible debentures. NRI investments through portfolio investment and government securities showed the similar trend. In 1992-93, all these have shown a very high rate of growth which needs careful interpretation due to depreciation of rupee in the preceding and same year. However, the large size of growth suggests a real increase though of a lesser magnitude.

An analysis of the trends in the private long-term capital flows in India's balance of payments also indicated a rising share of direct investment towards the end of 1980s, and early 1990s. It appeared that during early 1980s, direct investment remained insignificant compared to size of external deposits but has exceeded that during early 1990s. Though it is too early to comment on this trend, it seems that direct investment is going to be a more important channel in future for NRI investment.

Financial inflows coming through NRIs played a significant role in balance of payments. Remittances helped in containing the deficit in current account and inflows in capital account helped in financing partially the deficit in current account. A theoretical analysis suggested that an under-developed economy has to resort to higher rates of interest to attract capital inflow which becomes necessary to finance the rising bill of imports. The imports usually rise due to expansion of income in most of the countries.

The evidences collected through IIT migrants were not enough for determining the size of the capital flows coming through them. They, however, showed the types of investments held by various percentages of respondents. More than half of respondents had no investment. Among the rest external accounts seemed most popular form of investment. However, more than 30 percent of respondents had invested in some form of direct investment - shares, real estate, agriculture, manufacturing, business, etc. Quite a few migrants expressed their desire and inclination to invest in Indian economy, though they had not done so by then.

The whole analysis of trends in financial inflows associated with NRIs suggested that they are not only an important source of capital flows, they are probably good supplier of remittances also - thereby, partially confirming and partially rejecting the sixth hypothesis - that emigrating Indian HQM are good source of capital inflows but not an important supplier of remittances.

The study clearly showed that, regarding inflow of human capital through emigrating HQM, the Indian government had not pursued any specific policies so far. One scheme - Transfer of Knowledge through Expatriate Nationals (TOKTEN) - was started by United Nations Development Programme (UNDP) in many developing countries in which India also became a participant. The aim of this programme was to utilise the talented emigrated professionals for their countries of emigration.

As discussed earlier, the TOKTEN programme was initiated in India in 1980 and 331 experts visited India during 1980-1992. More than 90 percent of these came from North America and largest number belonged to the field of engineering and technology. Most of these experts were affiliated to academic or R&D institutions in their countries of residence and here also they provided consultancy services mainly to R&D sector. The average period of stay during 1989-90 turned out to be 4.8 weeks, being lower for earlier periods and higher for later phases. During this brief period, it was not possible to do any significant work involving transfer of knowledge or know-how and visits were envisaged to initiate a further process of long term collaborative interaction. Most of the visiting experts and host organisations perceived the visits to be useful and expressed satisfaction over the work done and inclination for

further interaction. However, as pointed out earlier, the real effectiveness of any such programme cannot be judged by perceptions only but by the actual changes brought about, which does not seem to have been possible in such brief period.

The actual consultancy under TOKTEN is supposedly free and rest of the cost is borne by UNDP which was calculated to be varying between US $672 and US $1466 per week in the 1980-90 period. This included all the expenses and daily allowance at UNDP rate. The high cost raises the question of the feasibility of such programmes in absence of any external source. Besides, the cost-effectiveness can be assessed only with the help of alternative cost of such money used, as any aid has various alternative uses. In this context, an equation between this programme and Bhagwati's suggestion of taxation has also been attempted, though the scheme does not have the basic element of compulsion necessary for any type of taxation. The experts provide their services to the home countries without any consultancy fee which means forgoing of that income by them and cost of expenses, etc. is borne by an UN organisation whose main resources come from developed nations, suggesting indirect contribution by developed countries to LDCs.

The Government of India established a centre for Interface for NRI scientists and Technologist (INRIST) in early 1990, through CSIR, to act as a nodal point of contact in India to establish linkages of NRIs with Indian organisations and also to interact with various institutional and voluntary organisation abroad at one hand and all organisation in India on the other. CSIR also has a scheme named Scientists Pool for those HQM who want to return and settle in India. The main idea has been to provide some sort of a security to returning migrants as the scheme provided for temporary jobs at various organisations till they could find suitable employment for themselves. As explained earlier, this scheme has been successful in this objective but as an incentive to come back it failed to lure the emigrants in absence of any special attraction.

Survey of IIT migrants revealed that almost 10 percent of them had gone with an intention of not coming back and they have not made any change in their decision. On the other hand, 90 percent had initially thought of returning once they finished their studies but changed their plans and continued to

stay on. However, 90 percent of them still want to come back at some later stage and a few of them started the process of looking into the opportunities in India. Regarding some relation with Indians involving inflow of human capital content, around 55 percent felt that they were engaged in such activities. However, for those in academics it was mainly limited to participation in joint projects and workshops and for those in private sector, it meant working in a joint venture which had some stakes in India too. However, for the self employed, it meant something more concrete, involving some investments and creating some employment opportunities in India.

With the help of this study, nothing can be said definitely about the Seventh hypothesis that emigraing Indian HQM are a total loss as far as the use of their education and training for the country's development is concerned. It, however, appeared from the study that till now, this remains a truth to a large extent but there also lies a good opportunity to develop policies on the line which could even utilise their training and experiences for country's benefits.

The study confirms the last hypothesis that the Indian policy response towards issues relating to HQM migration has been inadequte and to some extent, misdirected. Despite an elaborate range of banking programmes meant for NRIs, India cannot be said to have developed a holistic policy approach towards the whole issue. Various agencies and departments of the Government like Reserve Bank of India, the Finance Ministry and the Science and Technology department separately handle the fire-fighting type in which NRIs have been treated as probable sources of foreign exchange. Even at that level, as we have discussed, a change is desirable in order to develop a system which is more holistic and adds to the long-term development of the country.

The phenomenon of international migration of trained manpower, therefore, either taken inthe general sense or taken as institution based, poses complex problems regarding issues of associated outflows and inflows. However, on the basis of this study, certain suggestions are being made here, having relevance for both IIT migration and the general migration of HQM.

First of all, we would like to put forth one argument very forcefully that international migration of HQM in general including those from IITs is a result of various forces operating in international market and in the domestic market of both the sending and receiving countries. Apart from differentials existing in stanrdard of living, income, wage rate and opportunities, there are a number of importnat factors determining the size and extent of migration beyond the control of Indian or any other sending government. For example, as long as the labour market in US will keep needing immigrated HQM to fill the gaps, the immigration policy will be liberal and open towards them and as long as this remains so, HQM will keep entering till it competes well with others. As for overproduction, if IITs start producing, say, 30 percent less scientists and engineers, another few percentage of that production will migrate, for the reasons which lead to migration will exist. The increased globalisation of the world economy and simply the accessability of all the countries, make it impossible to stop the migration of HQM totally. Especially, in Indian case it becomes more difficult as the migration of HQM occurs initially in pursuit of higher studies. Hence, what India ought to do in this context is to have a mix of policy measures that would, on the other hand have some sort of diminishing effect on rate of migration and to compensate the losses involved, maximise use of emigrants' financial and human capital resources, while they are living in some developed country.

In this context, IITs certainly need to re-orient their syllabus so as to add to the perspectives of their graduates. The curricula need to have more flexibility in offering combination of courses and greater emphasis is needed on courses concerned to socio-economic realities and development needs of the country. Rural based projects can make IIT students more aware of the country's real needs. IIT students also tend to be very theoretical in their approach towards industrial problems. To avoid that inclusion of courses relating to actual shop floor experience can help. This can help not only in keeping some of the probable migrants back in India, but those who otherwise decide to stay back will also be more aware and better suited to develop required technologies and designs. Besides, this can also help in establishing a more active and deeper involvement with those who migrate.

The component of social cost is very high among IIT engineers, both in absolute and relative terms. Compared to any other engineering institution, the expenditure pattern for per student is substantially high. As such a migrating professional from IIT takes a very high amount of social investment along with him. As for lowering the social cost, there can be very few options. The IITs are premier institutions which enjoins upon them to maintain a particular level of quality. If a substantial share of IIT pass out has been migrating, majority is also opting to stay back and serve in the country and their quality cannot be compromised. Nevertheless, the entire expenditure pattern certainly needs an examination to identify the wastes - particularly in subsidies to students. At times, expenditures meant for the students do not benefit them though the society has to bear the costs. These wastes must be identified and done away with. Fee structure needs to be rationalised - a area which is already under probe by various committees. However, we have to remember that despite rationalisation private costs will have a small share in total costs. The raising of fee after a certain limit may be undesirable in the sense that that would raise the already higher share of students belonging to higher strata. However, this is not to say that fee should be kept at minimum, and allowed to fall in real terms, as has happened in IITs. They need to be raised (already in process) but at the same time, the limitation of this measure must be realised.

In order to compensate India for her losses associated with HQM migration, the much discussed and often repeated remedy of taxing the migrating professionals and the country of immigration seems totally sound and justified at theoretical level but it involves a number of practical difficulties making it almost inapplicable. Most of the professionals, as IIT survey suggests, first migrate as students and during the period of their studies, they do not have a very high income. As such, it would be wiser to consider a tax after they join work force. But either the tax to be imposed on migrating professionals after some years of migration over a period of time or to tax the immigrating country means involvement of that country at various levels, which itself would be a cumbersome affair. Apart from that, the difficulties associated with determination of rates and modes of payment are also quite complex. A lumpsum amount as tax at the time of migration does not have the problem of associating a foreign government but

that has other difficulties associated with it. At that time, it is not possible to distinguish between temporary migrants and prospective settlers. That would make the task of determining the amount very difficult. As such, it is wiser to consider a more practical solution to compensate India for her losses, rather than contemplating over the issue of taxing the migrating HQM.

Two types of outflows are associated with emigration of professional - financial and human capital and if these two are compensated with inflows, they can mitigate the adverse effects of brain migration. Unlike some other assessments, our survey of IIT migrants shows that they have been sending quite a substantial amount of remittances to their families, or in some cases to some organisations involved in rural or educational development or are working on some issues like gender and environmental concerns. The amount of remittances on an average turned out to be US $3773 per migrant per year. However, to generalise this finding for the general HQM migration, one needs to investigate further . Nevertheless, it can be confidently concluded that the amount of remittances coming from emigrating professional are not insignificant. Remittances are one area with least interference and to expand this source, certain policy intervention to increase its flow as well as direct its use are required. Most part of remittances are used for consumption purposes and only small percentage goes for investments. Certain incentives to direct remittances towards investment can be introduced. Investment should include small scale business, household enterprises and agricultural upgradations. Besides, savings can also be promoted out of remitted amounts by way of certain banking schemes. Certain premium can be introduced on exchange rate so as to attract higher remittances. Further, some incentives, either in the form of higher premium on exchange rate or through any other scheme, can be attached to remittances sent for charity purposes to voluntary organisations. Certain tax benefits exist in some of the developed countries for certain types of remittances - for example, United States gives some rebate on remittances sent for charity, and Canada gives tax rebate on remittances sent to dependent relatives. India can identify certain deprived sectors like education in rural areas or women's education or environmental consciousness and attach some premium to it. This would certainly help in attracting higher amounts of remittances from

greater number for these purposes. Schemes relating to remittances would also help the emigrated skilled and semi skilled personnel to the Middle East as they are also very important source.

The macro level trends in short to medium term capital inflows associated with migration of HQM coming through two external accounts - NRE and FCNR have shown that they are quite sensitive to political situations in India. Moreover, high rate of interest and risk of exchange rate makes the price of these accounts especially FCNR account, very high. Borrowing from international market at a lesser rate of interest would be more desirable rather than borrowing from NRIs at a high rate of interest. The reason for opting for NRI accounts rather than international market borrowing can only be political. Compared to FCNR, NRE account has shown more stability despite exchange rate risk. However, both these measures involve high price which does not seem justifiable. Moreover, as they were seen mainly as a vehicle of expanding foreign exchange reserves and the country seems to have reached a comfortable situation on that front lately. The survey of IIT migrants did not reveal anything significant in this regard except that only 16 percent of them had invested in these accounts. Hence it is advisable to do away with these accounts in a phased manner. In this context, it is more desirable to discontinue FCNR scheme, compared to NRE scheme.

As compared to bank accounts, private investments are more desirable as they usually involve long run interests and also help in extending some employment and output. However, the best form of direct investment is that which brings both finances and technology, brought by the investor himself not involving any huge amounts of royalty payments. Here, in case of direct investment encouragement to NRIs rather than other foreign nationals and bodies makes more sense as it involves the questions of ownership and control. This has wider social implications. As brought out by the survey of IIT migrants, a number of professionals seem interested to invest in India in their field of speciality. Mention may be made here of the Prime Ministers visit to the United States in 1994 where NRIs offered the supply of both huge

amounts of investment and technologies relevant for our economy. This needs to be encouraged as it involves inflow of both finances and brain without any heavy price as such. For this, more than any new scheme, what is needed is to develop infrastructure as well as a professional system and temperament which works efficiently. Development of infrastructure like communication, transport and other basic facilities would itself attract a lot of capital, as cited by many IIT migrants. And a system committed to professionalism would help in doing away with a number of disincentives associated with red-tapism. These can also minimise the role of vested interests - a major dissuading factor for many probable investors.

One more suggestion regarding NRI direct investment seems desirable. Though there are a number of incentives for special purposes available under various schemes, none of them relate to employment. India, being a labour abundant country having huge resources of educated manpower and widespread unemployment should make employment expansion one of the conditions for certain types of investments which can be combined to some sort of concession in the form of either tax rebate or some other relaxation depending on the desirability and feasibility. NRIs can be expected to be more sensitive and responsive towards India's unemployment problems.

Development of infrastructure can also work as an incentive for emigrants to return. The survey of IIT migrants revealed that many of them wanted to return and invest in India but are dissuaded by lack of infrastructure and prevailing corruption. This means that, more than anything else, development of certain basic areas are going to help. The idea of double citizenship was widely appreciated by IIT emigrants. They felt that this would help to take decisions regarding investment in India with more confidence and security. Some of them expressed their desire for investing in Indian economy or to work in India at some level by staying in India for half the time and to stay abroad for other half so as to continue to have a standing in that economy also. The proposal, however, needs further investigation before its introduction so as to know all the associated implications.

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54. See The Economic Times, May 18 and May 19, 1994 New Delhi for detailed reports.

Some of the emigrated HQM seemed to be trying to develop some links with India's development efforts at some level through their professions (without involving financial involvement), as revealed by survey of IIT emigrating professionals. Though the percentage of such emigrants is not low, the level of participation is not very significant in most cases either. However, the desire to associate themselves more actively with India's scientific and industrial development exists in many cases. They were quite willing to participate in short term assignments using their expertise and experience. In fact, a few of them had already taken such assignments once or twice. The existing programme working on similar line, i.e., TOKTEN has limited applicability as the number of visiting consultants is limited and the whole programme is guided and financed by UNDP. Besides, it does not seem to be having wide publicity, as none of the IIT emigrants mentioned about it while expressing a desire for having some such scheme. An alternative scheme can be developed in which special cells can be opened at institutions like IITs, which have very high rate of migration, to coordinate such assignments. These cells can have wider accessibility and publicity by use of Alumni Association and other such offices. Within this, migrants can be contacted for short to medium-term assignments, say, for 6 to 8 months, so that some meaningful interaction takes place. The study suggested that at a later stage of their career, the Indian HQM start facing some discrimination and feel like coming back to India. For them, at that time, satisfaction matters more than money. If encouraged they may like to come for these types of assignments combining with their holiday trips, or in any other alternative way, or even to finally settle down. INRIST can continue to be nodal agency for this scheme also at highest level.

On the whole, this study suggests in clear terms that the drains of finances and 'brain' associated with the migration of highly qualified manpower can be minimised or mitigated with the help of pursuing right policy mix, as outlined above, which could increase and consolidate the gains in financial and human capital coming through these emigrating HQM.

Lastly, what makes the research in the area of international migration most difficult is the lack of required database in almost all the related parameters. Systematic database concerning the emi-

gration of persons from different fields to different countries needs to be developed. Besides, information relating to return migration of HQM also needs to be compiled and updated continuously for future. Regarding financial inflows, very broad information are made public which severely restricts the scope of research. The data relating to remittances and bank deposits do not show the countries of origin making it difficult to determine the source. Countrywise distribution of both remittance and external bank accounts should be made public. Similarly, in the area of direct investment also many relevant information, including countries of origin and royalty and fee payments are not made available to public. The data once compiled at macro level, do not affect any secrecy of individual cases and contracts and hence need not be concealed on that ground. On the whole, data base in this area needs to be developed systematically not only to encourage research but also to have more transperancy.

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Note:

This reference bibliography is not exhaustive in the area of international migration of trained manpower and includes only those books, articles and reports which are of direct relevance to the present study. Mainly other studies were also seen but have not been included here as they were not referred to directly in this study.

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APPENDIX I

A NOTE ON THE SUREVEY OF IIT MIGRANTS

A survey of some migrants who had graduated from IITs and had left the country between 1968 and 1985, was conducted. Those who had migrated later than 1985 were not included because the idea was to surevy those who had by then, decided to stay abroad and join the work-force rather than those who were too new to formalise their plans. The survey was conducted through correspondence. Addresses were collected form four IITs - Delhi, Bombay, Madras and Kharagpur. The directory of the Alumuni Association was used for contact addresses of migrants from IIT, Delhi. For IIT, Bombay and IIT, Madras, the project coordinators of the two projects - which wee sponsored by Department of Science and Technology to prepare data-base for brain-drain related studies, were contacted for addresses. Both of them responded with the address lists, unlike those at IIT, Kanpur and IIT, Kharagpur who never replied. However, through personal sources, some of the addresses of migrants from IIT, Kanpur were collected. But, by no means addresses could be collected for IIT, Kharagpur.

Two rounds of questionnaires were sent. Altogether, questionnaires were sent to 350 IIT migrants in the first round. Out of these, 87 questionnaires came back due to change of the addresses. 128 completed replies were received and second round of questionnaires were sent to those 128 respondents. Out of these, 108 replied. Apart from these, two more IIT migrants, who had lived in foreign countries for quite long periods and had returned to India recently were interviewed. These 100 IIT migrants finally formed the sample for this study. Considering the difficulties associated with data collection through postal correspondence from abroad like change of address and the problem of not being able to send stamped envelopes for replies, etc, the rate of replies seems quite satisfactory. Hence, this sample can be treated as random and representative.

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APPENDIX II

QUESTIONNAIRES

Questionnaires were kept open ended to give respondents the freedom of space and choice of answer. It was felt that closed ended questions will restrict the respondents and limit the scope.

Questionnaire I

1. Name
2. Address & Telephone No.
3. Date of Birth
4. Where did you have most of your schooling before joining IIT? Place, State.
5. To which category does the above place belong? (a)Village (b)Town (c)City (d)Metropolitan City.
6. Year of joining IIT
7. Name of IIT (Place)
8. Qualification at the time of joining IIT
9. Degree(s) obtained from IIT
10. Discipline
11. Year of leaving IIT
12. Father's education
13. Father's profession
14. Mother's education
15. Mohers's profession
16. Family's monthly income at the time you joined IIT.
17. Size of family (parents and siblings)
18. The amount which you used to spend per month, on an average, while studying at IIT (taking also into consideration the lumpsum you used to pay at the beginning of each semester).
19. If you had not got into IIT, what was the next best alternative you had in mind, which was available to you.
20. Would you like to give some idea what it would have costed you per month if you had gone for that alternative.
21. Amount of scholorship, if any, during your stay at IIT.
22. Duration of Scholorship.
23. Nature of Scholorship (whether loan or aid or else)
24. Source of Scholorship.

Qustion related to your staty in foreign country.

25. Year of going abroad.
26. You went as student/on job
27. Number of years spent as student.
28. Degree or diploma obtained there and name of the Institute/University.
29. Name of Organisation/Firm/University you are working with
30. Designation
31. Income (a)Starting (b) Present (mention the change in job, if any, with the change in income it brought. (c) If student, write the amount of fellowship as well as the income from any other source (mention the source).

32. (a) Remittances whatever you generally send or have sent at any time (b) Can you give some idea how that money is spent here in India. (Consumption/Investment). (c) Around what percentage on investment on what on investment.
33. About your relationship with India through your job.
    (a)If you are in academics: (i)are you involved in a research which had direct relevance to Indian economy. If yes, give details (ii)do you take part in Indian academic actitivies often? If yes give details. (iii) do you contribute or associate yourself actively in Indian industrial/agricultural/rural or any other development any way? If yes, how? If not, do you have any plan to do so?
    (b) If you are in a firm or organisation. Does your firm or organisation has any relationship with India which helps Indian economy and development> If yes give details.
    (c) If you are an entrepreneur. (i) Give details of your enterprise (nature, investment, etc.) (ii)Details of interaction, if any, with India.
34. Investment in India. If any, give details(amount of investment, type of investment etc.).
35. Your plans about returning to India. (a) Initially though (b)Changes, if any, mention that with reasons.
36. Your perception of brain-drain.
37. Your treatment in U.S.A.
38. In case I choose you for detailed case-study, would you cooperate? That will involve further interaction.

Questionnaire II

1. Initially when you went abroad, what was your visa category?

2. When did you feel thae need for another category of visa and why? When did you get it changed ? State the new category.

3. Have you got the "green card"?
   If yes, (a) When did you apply for it ? (b) When did you get it? (c) What was your general experience regarding the process.
   If no, are you planning to apply for it or have you already applied.

4. Do you have any or some of your own or parent family back in India dependent on you financially ? If yes, how do you share the financial responsibility? (Please state in terms of proportion of the parent family's income).

5. Do you send a regular remittance to India irrespective of your income or the amount sent is proportionate to your incoem, i.e., increasing with increase in income?

6. Do you think the exisiting banking facilities for the purpose are efficient ? If not, what other ways should be ligitimised?

7. Do you have any plan to invest in India in near future? If yes, how? Give some detail as to why you prefer any particular method or plan to others.

8. Recently, the Indian Government has announced several changes in its NRI policy. Several new schemes have come to attract more foreign exchange remittances and investments. Returning Indian Foreign Exchange Entitlement Schemes (RIFEES), higher rate of interest on foreign currency non-resident (FCNR) accounts, increase in the number of days allowed to NRIs to stay in India, etc. are some of them. What is your reaction towards them? Are they likely to influence your decisions regarding remittances and investment? Do you think these changes are on desired lines?

9. Most of you have some money in NRI accounts. Do you want to keep that money there itself or are you interested in investing them eventually in other schemes like mutual funds of Nationalised Banks, units of Unit Trust of India, shares, bonds, etc.?

10. Do you foresee obstacles to investing directly in Indian industries, if yes, what are they?

11. Do you have any plans to contribute to transfer of technology by associating yourself with any development plan related to your training and profession? If yes, please give details. If not, can you suggest any scheme that may attract such contributions from non-resident Indians?

12. Do you think granting of dual citizenship would have any positive effect on NRI involvement in India's development process? If yes, in what way?

APPENDIX III

A NOTE ON THE SIZE OF EMIGRATION OF HQM FROM INDIA TO THE DEVELOPED COUNTRIES

India does not have a systematic data-base for emigration of HQM. As such, to see the trends in this, usually the soureces from the countries of immigration are relied. Table A-I shows the trends in immigration from India to these industrialised countries - United States, Canada and United Kingdom. These three have bene the most important destinations for Indian emigrating hqm.

Though these data do not exactly show the size of brain drain related immigration, as has been discussed in the text at places, they do indicate the emigration trends of Indian HQM. Hence it was considered desirable to add this table as an index.

CONTD....

TABLE A.1

TRENDS IN IMMIGRATION FROM INDIA TO SELECTED INDUSTRIALISED COUNTRIES: (1951 - 1990)

YEAR	UNITED STATES	CANADA	UNITED KINGDOM	YEAR	UNITED STATES	CANADA	UNITED KINGDOM
1951	109	120	N.A.	1971	14310	5313	6900
1952	123	226	N.A.	1972	16926	5049	7600
1953	104	169	N.A.	1973	13124	9433	6240
1954	144	208	N.A.	1974	12779	12731	6650
1955	194	224	N.A.	1975	15773	10106	10200
1956	185	254	N.A.	1976	17487	6637	11020
1957	196	186	N.A.	1977	18613	5514	7340
1958	323	325	N.A.	1978	20753	5112	9890
1959	351	585	N.A.	1979	19708	4517	9270
1960	391	505	N.A.	1980	22607	8491	7930
1961	421	568	N.A.	1981	21522	8263	6590
1962	545	529	2900	1982	21738	7792	5410
1963	1173	737	15500	1983	25451	7051	5380
1964	634	1154	13000	1984	24964	5513	5140
1965	582	2241	17100	1985	26026	4038	5500
1966	2458	2233	16700	1986	26227	6970	4210
1967	4642	3966	19100	1987	27803	9747	4610
1968	4682	3229	23100	1988	26268	10432	5020
1969	5963	5395	11000	1989	31175	8836	4580
1970	10114	5670	7200	1990	30667	10662	5040

Sources :(a) For the United State, US Immigration and Naturalisation Service, STASTICAL YEAR BOOK, annual issues. (b) For Canada Canadian Employment Immigration Centre, Ottawa. (c) For the United Kingdom CONTROL OF IMMIGRATION : STATISTICS, annual issues (for the period 1973-1990); Research and Statistics Department, Home Office, London, (for the period 1962-1972) - As given in Nayyar(1994)

Notes : (a) The above data on immigration are reportd by country of birth for the United States, by country of last permanent residence for Canada, and by country of nationality for the United Kingdom.

(b) Information on immigration from India to the United Kingdom is not available for the period before 1st July 1962 because, until then, Commonwealth citizens were not subject to immigration control.

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