

Title of the Project: Pilot Study on Magnitude and Nature of the Brain Drain of Graduates of the IIT, Bombay

Principal Investigator: Prof. I. Mahadevan, Prof. S.P. Sukhatme

Implementing Agency : Deptt. of Humanities and Social Sciences, IIT, Bombay.

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Objectives :

- ▶ To quantify the extent of the brain drain for a specific set of alumni of IIT Bombay.
- ▶ To obtain a career profile of the IIT Bombay graduate.
- ▶ To understand the motivations and aspirations of those graduates who proceed abroad and those who stay on in India, and the reasons for staying on abroad or returning to India.
- ▶ To obtain feedback on the curriculum at IIT Bombay.

Executive Summary :

Sections 1 & 2 – Introduction and Methodology:

1. In spite of the large volume of writing available on the brain drain from India, statistical data is scarce.
2. There are no studies available giving quantitative estimates of the number of IIT alumni who have settled abroad.
3. The present study has been conducted keeping the above factors in mind. It seeks to quantify the extent of the brain drain amongst graduates of IIT Bombay. It also seeks to understand the process of the brain drain and to obtain a profile of IIT alumni by analyzing the type of work they are doing..
4. The specific set of alumni selected for the study were B.Tech. graduates of IIT Bombay who passed out in the five year period from 1973 to 1977. The total number of these alumni is 1262. This set constitutes about 20 percent of all B.Tech graduates of IIT Bombay.
5. A systematic search was first made to locate the current address of as many alumni as possible. As a result, 837 addresses were obtained. This constitutes 66.3 percent of the study population. This was followed by a detailed questionnaire .
6. The alumni forming part of the study have been divided into three categories :

Category X : Alumni who have been working in India since they graduated from IIT Bombay (including those who have been abroad for short-term training those who have been sent abroad by their Company or Organization for training/assignment, and those who have been abroad just for visits .

Category Y : Alumni who are currently living abroad more or less on a permanent basis.

Category Z : Alumni who have been abroad for more than one year and have returned to settle and work in India. .

Section 3 – Magnitude of the Brain Drain

1. Based on the current address list, the overall result on the magnitude of the brain drain is that 30.8% of the alumni who passed from 1973 to 1977 have settled abroad. This percentage is estimated to be accurate to about +- 2 percent. Out of those abroad, 82.6 % are in USA/Canada, 7.8 % are in the Middle East and only 9.7 percent are in all other foreign countries.

2. The discipline wise break-up (Table 3.1) indicates that the highest percentage abroad (42.8 percent) graduated in Electrical Engineering, while the next highest (33.5%) graduated in Chemical Engineering. Approximately 25 percent of the alumni who graduated in Mechanical Engineering, Civil Engineering and Aeronautical Engineering have settled abroad. The lowest percentage (around 20%) graduated in Metallurgical Engineering.
3. An analysis of the addresses of alumni who graduated in the upper quarter of their class indicates that 42.9 percent in this group are now settled abroad. This is 12.1 percent higher than the percentage for the total population
4. It is estimated that the total percentage of alumni who went abroad was 39.4 . Of these 8.6 percent have returned and 30.8 percent have stayed back abroad.

Sector 4 – Profile of the IIT Bombay Graduat

The total number of replies received to the questionnaire was 501. This is about 40% of the total population under study. Out of these replies, the break-up is as follows : Category X- 322, Category Y-140 and Category Z-39.

Postgraduate Study :

1. 64.1 percent of alumni in all categories have obtained a postgraduate degree or diploma, the highest percentage of 90.7 being in category Y. Nearly half (49.5%) of those who have undergone postgraduate studies have opted for management or related fields (Table 4.1 and 4.2).
2. 12.2% of the alumni have obtained the Ph.D. degree, Most of this number are abroad (Table 4.3).
3. 10.5 percent of the alumni have done postgraduate work at IIT Bombay of another IIT.

:Professional Status, Income and Related Statistics:

4. An analysis of the professional status shows that in categories X and Z (alumni in India), a very large number of alumni (133 out of 322 and 19 out of 39, i.e. 42.1%) are in the executive/manager class. Significantly the next highest number in these categories (93 out of 322 and 10 out of 39) are entrepreneurs/ industrialists/self-employed consultants. This corresponds to 28.5 percent of categories X and Z and indicates that a large number of IIT alumni in India run their own business. In category Y (alumni settled abroad), the dominant professional status is executive/manager or practising engineer (Table 4.5).
5. A classification of alumni by the sector in which they are working indicates that the vast majority (83.2 percent) are in the private sector (Table 4.7)
6. The mean annual income for salaried alumni in category X is Rs. 57,990/- A break up in terms of postgraduate education shows that alumni with a postgraduate degree/diploma in management have the highest mean income of Rs. 63,100/- (Table 4.8).
7. The mean annual income for alumni in category Y is \$451,895. In this category also, a break up shows that alumni with a postgraduate degree/diploma in management have the highest mean income of \$ 61,400 (Table 4.9)
8. The mean annual income for alumni in category Z is Rs.63,840 Here also, alumni with a postgraduate degree/diploma in management have the highest mean income of Rs.77,500 (Table 4.10)

Nature of work :

9. An analysis of the nature of work being done by the alumni in his present job shows that in both categories X and Z, the largest number

(37.9 %) and 53.8%) are primarily engaged in some aspect of management like project planning, marketing, finance, etc. The next highest number (24.5 percent and 18.0 percent) are engaged in activities like production, maintenance/trouble shooting and construction/erection. This is followed by teaching/R and D/design (16.5% and 15.4%). On the other hand, in category Y, the numbers in teaching, R and D, and design, and in management are about the same (33.6% and 32.1% respectively). This difference is clearly a reflection of the fact that many of those abroad have a research degree (Table 4.14).

Section 5 – Understanding the Brain Drain

Initial Decision to Go Abroad.

1. Most of the alumni in category Y took the decision to go abroad when they were studying in IIT Bombay. Further in more than 70% of the cases, the purpose of the initial visit was for undergoing further studies (Table 5.1 and 5.3).
2. The most dominant factor influencing the decision to go overseas is the desire to take advantage of wider and better opportunities abroad. Other influences (in order of important) are (i) curiosity, adventure and freedom, (ii) the persuasion of family and friends, and (iii) the attraction of developed countries and their academic facilities (Table 5.4).

Initial Decision Not to go Abroad

An analysis of the replies given by alumni in category X shows that a very substantial number (26.7 percent) did plan to go overseas for further study. Of these, 69.3 percent secured admission. However, very few obtained offers of financial aid. Thus it appears that lack of funds is a major deterrent to going abroad and that many more IIT students would go if more financial aid is available to them from US universities (Table 5.5)

3. The most dominant factor influencing the decision of alumni in category X not to go abroad is given as family responsibilities (Table 5.6). Visit to India from Abroad :
4. One-third of the alumni settled abroad have visited India four or more times, while on-fourth have visited three times. Thus most of the alumni in category Y are seen to be maintaining fairly close ties with India (Table 5.9).
5. Information on visits made to India with the intention of settling down shows that about one fourth (26.4%) of the alumni in category Y visited India with this intention. This is a significant number compared to the number of alumni in category Z, who did return.

Decision to Settle Abroad :

6. 75.7 percent of the alumni in category Y had not planned on staying back overseas when they went initially. Only 17.1 percent had planned on staying back (Table 5.14).
However, based on positive experiences abroad, 30.0 percent of the alumni in category Y say that they planned a definite course of action for staying back. This course of action was initiated during the period of studies. A large number (57.9 percent) say that they stayed on without really having planned or made a conscious decision to do so (Table 5.15).
7. The three main reasons given for staying back overseas are
 - (1) the alumnus adjusted well overseas in his profession.
 - (2) The low and inadequate pay in India as compared to the earnings abroad.
 - (3) The good educational experience encountered overseas (Table 5.16).

Life Overseas :

9. An analysis of answers given by alumni in category Y regarding various

- aspects of life overseas shows they rate aspects related to their work and profession and to economic benefits as excellent or very good. In striking contrast, aspects involving social adjustment of the alumnus and his family are generally rated only as good or satisfactory (Table 5.17).
10. There is close agreement between the perceptions of alumni in India regarding conditions abroad and the views of alumni in category Y on the same subject (Table 5.18).
 11. Most alumni in category Y have responded very positively to the question regarding the type of professional contribution they would be willing to make in India. A substantial number (33.8 %) have indicated an interest in a permanent return (Table 5.19). Decision to Return to India :
 12. 77.5 percent of alumni in category Z have indicated that they had planned on returning even prior to leaving India (Table 5.20).
 13. Family ties is listed as the dominant reason for return (Table 5.21). Life in India After Returning from Abroad :
 14. About one-third of the returnees (category Z) state that they faced no major problems upon their return home. The remaining two-thirds did face problems of one sort or the other.
 15. 32.5 percent of the respondents in category Z state that there have been a change in the orientation of their career after their return to India, while 37.5 percent state that there has been no change. 60% of those who have returned state that they have no regrets about having returned to India, while 22.5 percent do have some reservations (Table 5.22). Working Conditions in India :
 16. The responses of alumni in category X to various aspects of working conditions in India show that the largest number (41.5 percent) are partially satisfied with working conditions. Only 20.4 percent indicate full satisfaction, while 20.8 percent indicate very little satisfaction. A very small number 5.7 percent say that they are not all satisfied with working conditions (Table 5.23). Perceptions Regarding Various Features of Life in India and the West .
 17. A comfortable standard of living is ranked as the most positive feature of a western society which influences Indians to stay abroad. On the other hand, cultural incongruence is perceived as the most negative feature which influences them to return (Table 5.24 and 5.25)
 18. Strong kin and family ties. Familiarity with environment and roots, and Cultural congruence are seen as the three most important features aiding a decision to stay in India. The most dominating negative feature aiding a decision to stay abroad is the all pervading presence of a stifling, unresponsive bureaucracy (Tables 5.26 and 5.27). Suggestions Regarding an Organized Programme for Reducing the Brain Drain :
 19. Most of the respondents in categories Y and Z have given some useful suggestions in regard to steps which could be taken to reduce the brain drain. The two major suggestions are (1) Establish an effective organisation which can provide information to alumni on jobs and opportunities, counselling, R and D guidance, business consultancy, etc. (2) organize exchange programme seminars, class reunions, joint research projects and joint ventures.

Section 6 – Feedback on the B.Tech. Curriculum

1. Alumni were asked to list aspects of their experience at IIT Bombay which they consider relevant and not relevant to their effectiveness as professionals. The answers given show that many respondents in all categories appreciate the fact that they underwent a well-planned curriculum with emphasis on fundamentals and theories, that they developed good analytical skills and that there was keen competition.

However a number a respondents in categories X and Z feel that there was a lack of emphasis on practical work and inadequate industrial exposure. As regards aspects of their experience at IIT Bombay outside the class room, most respondents consider their hostel life to have been an enriching experience in which they developed independence the ability to interact and get along with people of varied backgrounds, and the ability to work as a team

2. Alumni were asked to suggest a broad break-up up credits for the B.Tech. curriculum. Analysis of the answers shows that under all the subject heads, the mean percentage suggested by the alumni falls in the range suggested by the All India Council of Technical Education (Table 6.1 to 6.6).
3. Finally alumni were asked to mention specific courses which they would like to see introduced in the B.Tech curriculum. Many respondents in all the three categories would like to see the introduction of one or more courses in management or management related areas, and a course in computers. Many respondents in category X feel that it is necessary to add on at least one semester or even one year of practical training in industry. The need for improved communication skills has also been stressed by some alumni.