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# Private and Social Returns to Higher Education

## A Case Study of Delhi Graduates

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*An attempt is made in this paper to measure the private and social rates of return on investment in the various degrees offered at the Delhi University.*

*In spite of the heavy per-student cost, both private and social returns are surprisingly high. Private returns are even higher than in most Indian industries.*

[The authors are grateful to T W Schultz and Arnold C Harberger.]

THE Delhi University has expanded nearly eight-fold in terms of enrolment during the last 15 years, and still the demand for enrolment is much larger than the enrolment capacity of the university.<sup>1</sup> The potential excess demand is bound to cause social unrest and even political pressures endangering the peaceful academic climate.

With the growing awareness, changing social values, and economic prosperity there is increasing desire for education, but at the university level the demand for education is not necessarily for social reasons. At this level, the economic benefits of education are direct and foreseeable. Hence a student, or his parent, considers higher education as an investment. Investment decisions depend on expected returns and the cost of higher education. Given the cost of education in universities, a typical student would choose to go to a university, and a field of specialisation, that would provide him maximum return on his education. When returns on higher education are lower than the alternatives available to him, a student would find it economically advantageous not to spend his money on higher education.

In a university a student bears only a small part of the total cost of his education. Even though the social returns, the returns on the total cost of his education, may be low, the private returns, the returns on the resources a student actually commits, may be substantial to make his investment in higher education profitable.

The number of seats is, however, limited by the availability of public resources. When a major portion of these resources is coming from public funds, higher education is one of the many claimants to the tax payer's money. When there are public projects with higher rates of return than higher education, then from society's point of view rational allocation of public resources demands that investment in higher education be restricted.

The objective of this study is to measure the private and social rates of return to investment in various degrees offered at the Delhi University. This study corresponds to the graduates of 1954 ("Employment Survey of the Alumni of Delhi University", Ministry of Labour and Employment, 1962). Of course, the situation has changed since then, but the prospects of employment

of Delhi graduates have not changed enough to affect our conclusions.<sup>2</sup>

Before proceeding to the methodology and calculations, we digress to explain the concept of internal rate of return.<sup>3</sup> Let us consider a hypothetical project that costs 100 paise. Once you purchase it, it starts giving an income of, say,  $x$  paise per year, every year thereafter, forever. The number  $x$  is called the internal rate of return on that project, to be read as, "the internal rate of return on the project is  $x$  per cent". To give an example, consider a project that costs Rs 200, and gives a steady stream of Rs 30 every year. The project is paying 15 paise per rupee, or the internal rate of return is 15 per cent. When two projects are on sale, one with a higher internal rate of return than the other, then naturally one wants to buy the project with the higher internal rate of return. Actually, when the internal rate of return is higher than 3 per cent, the returns beyond 40 years are inconsequential. In a real world, projects do not give a steady stream of income. Even though a project does not give a steady stream of income, by computing its internal rate of return,

we can visualise it as a project with steady income stream. This makes it easier to compare two projects that would be difficult to compare otherwise.

In this study we computed internal rates of return to the following Degrees offered by the Delhi University:

- I B A Pass
- II B Sc Pass
- III B Com
- IV B A Hons
- V B Sc Hons
- VI M A Lang
- VII M A Hist, Pol Sc, Phil
- VIII M A Econ, Com, Math
- IX M Sc
- X Lib Sc
- XI Law

The incomes of graduates would, of course, depend on the type of employment they get. The type of job may depend on a number of factors such as marks scored, family contacts, etc. Unlike technicians, Delhi students are not trained for a specific job or a scale of pay. The average income for each educational category is computed on the basis of earnings distribution of 1954 graduates given in Table 1.<sup>4</sup>

All the students from Delhi University do not succeed in getting employment immediately after graduation. Only 60 per cent of the 1954 graduates were employed within six months after graduation, and the rest were absorbed gradually. Degree-wise details of incidence of unemployment is given in Table 2.

In computing returns to higher education, we assumed that the graduates were employed at midpoint of each column of Table 2 and started earning an increment of 3 per cent of starting income thereafter.<sup>5</sup> Each person was assumed to remain employed for a period of 40 years. Since all the salaries are paid monthly, and increments are given only yearly, adjustments were made accordingly.

Students enter the university after completing higher secondary. If they did not go to the university and got a job they would be earning, say, Rs 150 on the basis of their higher secondary education.<sup>6</sup> So the higher education should be viewed only as a source of income additional to what they would be getting otherwise. To take an example, suppose by going to the university and spending Rs 3000 for a degree, one can increase his salary by, say, Rs 50 a month (or Rs 600 a year) his private rate of return on higher education is 20 per cent. The increase in earnings as a result of the Bachelor's degree

TABLE 1: EARNINGS DISTRIBUTION OF 1954 GRADUATES AT THE TIME OF THE SURVEY (1958)

Degree	Monthly Earnings (in Rupees)				Income Mean (Rs)
	Below 200	200-300	300-500	500 and over	
Mean income in the cell	Rs 150	Rs 250	Rs 400	Rs 600	
B A Pass	0.611	0.203	0.102	0.084	233.60
B Sc Pass	0.553	0.277	0.170	0.0	220.20
B Com	0.603	0.277	0.096	0.024	212.50
B A Hons	0.408	0.367	0.122	0.103	263.55
B Sc Hons	0.417	0.541	0.042	0.0	214.60
M A Lang	0.313	0.332	0.292	0.063	284.55
M A Hist	0.354	0.375	0.208	0.063	267.85
M A Econ	0.227	0.383	0.336	0.054	296.60
M Sc	0.081	0.662	0.243	0.014	283.25
Lib Sc	0.0	0.727	0.273	0.0	290.95
Law	0.273	0.350	0.264	0.113	301.85

Source: Computed from "The Employment Survey of the Alumni", *op cit*.

TABLE 2: INCIDENCE OF UNEMPLOYMENT AMONG 1954 GRADUATES

Degree	Employed at			Unemployed	Total
	Less than 1 Year	1-2 Years	2-3 Years		
B A Pass	154	37	16	14	221
B Sc Pass	47	29	12	9	97
B Com	98	27	3	4	132
B A Hons	109	34	9	10	162
B Sc Hons	68	6	6	3	83
M A Lang	21	2	0	8	31
M A Hist	10	2	2	5	19
M A Econ	33	6	1	5	45
M Sc	27	2	1	1	31
Lib Sc	8	1	0	0	9
Law	116	12	15	16	159

Notes: (1) All the unemployed graduates were assumed to have obtained employment at the end of 4 years.

(2) The graduates reported to be "not seeking employment" are not included in this Table.

Source: Computed from "The Employment Survey of the Alumni", *op cit*.

TABLE 3: PRIVATE AND UNIVERSITY COSTS PER STUDENT PER YEAR (in Rupees)

Degree	Assumption I		Assumption II	
	Actual Private Cost	Ed Exp	Foregone Incomes	Univ Costs
B A	1000	450	1800	800
B Sc Pass	1000	450	1800	1600
B Com	1000	450	1800	800
B A Hons	1000	450	1800	800
B Sc Hons	1000	450	1800	2000
M A Lang	1320	500	2640	1000
M A Hist	1320	500	2640	1000
M A Econ	1320	500	2640	1250
M Sc	1320	500	2640	2500
Lib Sc	1750	460	2640	2000
Law	1800	500	2640	1200

Note: In computing Foregone Incomes, we did not allow for unequal employment opportunities in various courses.

Source: Cols 1 and 2, Khusro's study, *op cit*.

would be increase in the income on what one would be getting with his higher secondary (Rs 150). Similarly increase in income due to a Master's degree would be increase in income on what one would be getting with a

Bachelor's degree (Rs 220).

The cost of higher education consists of two components:

- (1) the cost directly borne by a student (private cost); and
- (2) the cost borne by the university,



net of tuition fees. Our calculations of private costs are based on two alternative assumptions:

*Assumption I:* The actual average expenditure of the Delhi University student on food, clothing, education, etc, as reported in A M Khusro's study<sup>7</sup> for the 1958-59 students of the Delhi University.

*Assumption II:* The actual educational expenses and transportation costs as reported in A M Khusro's study plus the "earnings foregone" by a student because of going to school instead of taking a job.<sup>8</sup> In computing foregone earnings we assumed that the salaries that they would have been paid had they taken up a job were Rs 150 and Rs 220 per month respectively for higher secondary and Bachelor's degree.

The cost borne by the Delhi University for the 1954 graduates was taken on rough calculations made by the authors, allowing for generous margin on the upperside. The costs per student per year for 1954 graduates are given in Table 3, together with private costs. We realise that the incomes and costs of 1969 graduates, for various degrees, are different from the figures given in this paper. A reader with actual figures relating to the present conditions may revise the internal rates of return by consulting Table 5 (which can be easily interpolated by "free hand smooth drawing").

The internal rates of return on all the degrees for the 1954 graduates are given in Table 4.

The private rates of return, on all the degrees, are, as expected, considerably higher than the all-India average (8.1 per cent) for Bachelor's and Master's degrees as reported by Nalla Gounden.<sup>9</sup> What comes as a surprise to us is that these private internal

rates of return are even higher than what could be obtained from investment in the industrial sector of the Indian economy (16-20 per cent).<sup>10</sup> Higher and ever increasing pressures on the Delhi University for admissions are in complete conformity with private economic rationality.

The social rates of return on Delhi University education both for undergraduate and post-graduate degrees are considerably higher than the all-India average (7 per cent) for the corresponding degrees.<sup>11</sup>

A comparison of private rates of return on various degrees belies a few popularly held beliefs in preference of fields of specialisation<sup>12</sup> and raises a few questions for the educational administrators regarding admission policies into various courses.

Interestingly enough, the internal rates of return, both private and social, on all the degrees (except history) are consistently higher than those from engineering degrees (social rate 9.8 per cent and private 13.5 per cent).<sup>13</sup>

The high rates of return, private and social, could be due to various factors. Isolation of these factors calls for further empirical research. The difference between private and social rates of return reflects the "subsidy" a student earns in addition to earnings on education. The "subsidy" on Delhi University education is higher than some place else.<sup>14</sup> The high "subsidy" is not just because of high unit costs; when the social internal rates of return are very low, for the same per unit costs, the "subsidy" would be much smaller.

Given the labour market structure, and the academic training of the graduates, the pressures on Delhi University for expansion reflect

(1) pressures for higher education of

TABLE 4: MARGINAL PRIVATE AND SOCIAL INTERNAL RATES OF RETURN ON VARIOUS DEGREES

Degree	Assumption I		Assumption II	
	Private	Social	Private	Social
B A Pass	29	18	20	14
B Sc Pass	24	11	16	10
B Com	23	14	16	11
B A Hons	36	22	24	18
B Sc Hons	24	10	16	8
M A Lang	25	16	15	12
M A Hist	19	12	12	9
M A Econ	30	18	18	13
M Sc	27	12	16	9
Lib Sc	41	22	26	18
Law	24	16	19	14

similar type, and

(2) pressures for a slice in the high "subsidy".

This exercise points out that higher education can be a paying investment even in a less-developed country like India. Why is it that only Delhi University is a paying investment; and not other universities? There are a wide variety of speculations as to the reasons, but none of these have any valid empirical foundation. Isolation of these factors and establishing their relative weights on an empirical basis must precede policy recommendation.

NOTES

- 1 Enrolment in Delhi University has increased from 10,000 in 1953 to 80,000 in 1969.
- 2 There is evidence that educated unemployment in the country as a whole has remained more or less a constant proportion of the rapidly growing stock of educated labour. See M Blaug, *et al*, "Educated Unemployment in India", London School of Economics (forthcoming).

TABLE 5: PRESENT DISCOUNT VALUE OF RUPEE PERMANENT MONTHLY INCOME STREAM, ADJUSTED FOR UNEMPLOYMENT AND 3 PER CENT YEARLY INCREMENTS

Course Number	Internal Rates of Return													
	6 p c	8 p c	10 p c	12 p c	14 p c	16 p c	18 p c	20 p c	22 p c	24 p c	26 p c	28 p c	30 p c	
I, IV, VIII, XI	232	174	135	109	90	76	66	57	51	45	41	37	34	
II, VI	227	169	130	105	86	72	62	54	47	42	38	34	31	
III, V	235	176	138	111	92	78	67	59	52	47	42	39	35	
VII	222	164	127	101	83	69	59	51	45	40	36	32	29	
IX	237	178	139	112	94	79	69	60	54	48	44	40	36	
X	239	180	141	114	95	81	70	61	55	49	45	41	37	

Note: To find out the internal rate of return on a given course, compute (total cost for the course/increase in monthly earnings) and look in the row for appropriate course number.

- 3 For details on this concept, see John A King, "Economic Development Projects and Their Appraisal", John Hopkins Press, 1967.
- 4 The money incomes of these graduates need not reflect their marginal productivity to the society. Of these graduates, 65 per cent were employed by government agencies and 10 per cent by universities. Since we do not have information on the "co-efficient of inefficiency" we assume that they are worth the wage they are getting from the society. In our calculations, non-pecuniary returns are not taken into account.
- 5 An annual increment of 3 per cent is a conservative estimate. The actual increment may be even higher. A rate higher than 3 per cent would, costs remaining the same, give an even higher rate of return.
- 6 In 1960, a matriculate of 1954 was reported to be earning Rs 187 per month in Bombay and Rs 133 in Ludhiana. See "Employment of Matriculates: A Case Study", Ministry of Labour and Employment, New Delhi, 1964.
- On an all-India basis a matriculate in the relevant age group earns Rs 120 per month, see: A M Nalla Gounden, "Education and Economic Development", (Unpublished Ph D thesis, Kurukshetra University, 1965). We expect that for a

Delhi higher secondary an estimate of Rs 150 per month is closer to the reality.

- 7 A M Khusro, "Living and Working Conditions of Students of the Delhi University", Asia Publishing House, Bombay, 1967.
- 8 On the basis of estimates of unemployment available, both for matriculates and graduates, we have assumed that a higher secondary on the average remains unemployed for 12 months and a Bachelor's degree holder for 6 months, for purposes of estimating earnings foregone.
- 9 Nalla Gounden, *op cit*, p 98.
- 10 Arnold C Harberger, "Investment in Men versus Investment in Machines: The Case of India", in C A Anderson and M J Bowman, "Education and Economic Development", Aldine, 1965.
- 11 Nalla Gounden, *op cit*, p 97.
- 12 It is popular that B Sc (hons) is better paying than B Sc (pass), and B Com is better paying than B A Pass.
- 13 The rate of return on engineering degrees (B E) are based on 1960-61 data and do not reflect the post recession or overproduction conditions of 1966 onwards, see Nalla Gounden, *op cit*, p 98.
- 14 The "subsidy" on engineering education is 3.7 per cent and all-India higher education is 1.1 per cent.

Acute shortage of good scrips alone can sustain a boom in equities. The corporate sector is doing well and it is expected to do still better because of the step-up in developmental outlay. The political weather, of course, continues to be quite chilly, but the stock market seems to be fully acclimatised to it by now. All eyes are now on the Anjaria Committee's report on resumption of forward trading. The report is due to be submitted shortly. But what really matters is Government's decision on it.