

CHAPTER VIII

RETURNS TO HIGHER EDUCATION IN TAMIL NADU

The benefits of education may be economic (monetary) as well as cultural (Non-monetary). These may further be classified into individual (private) or social (public) or a mixture of both. For instance, a person with more education may be earning a higher income. That is the monetary aspect of the private returns. It may be that a part of the gain accrues to the society at large. This is the social economic benefit of education. As for instance, in the case of scientific and research workers. Education may have an attraction to some individuals not on economic grounds but on cultural grounds, as may possibly be the case with higher education of women. Indeed, education is increasingly becoming an item of wide cultural consumption. This represents the private non-monetary benefit of

education. Finally, a society may have a stake in educating its citizen on political and other grounds, as is illustrated in the laws relating to compulsory education. This represents the social non-monetary benefits of education.

In brief, the benefits of education can be summed up as follows:-

Benefits of Education (Returns to Education)	1) <u>Economic</u> (Monetary)	-	a) Individual (Private)
			b) Social (Public)
	2) <u>Cultural</u> (Non-Monetary)	-	a) Individual (Private)
			b) Social (Public)

Since education involves the use of a vast amount of resources, it is natural to ask the questions relating to the returns from education, the allocative efficiency and the efficiency of private decisions.

In calculating the rates of returns, only those costs and benefits are considered which are measurable and which can be transformed into monetary terms. This is an important limitation of all the calculations of the rates of return to education.

There are three methods of calculating the returns:

- 1) The benefit-cost approach,
- 2) The internal rate of return approach, and
- 3) The net discounted present value approach.

Since costs and benefits of education are spread over time, it is necessary to discount the future streams of costs and benefits. In the benefit-cost analysis, the present value of future benefits is compared with the present value of costs of education. For obtaining the present value, the future streams of benefits and costs are discounted at a certain rate of interest. Since the choice of the rate of interest can be arbitrary, the method of internal rate of return is adopted wherein the rate of discount is derived from the model itself.

In other words, benefit-cost ratio is measured as:

$$\frac{\sum_{t=1}^n \left(\frac{B_t}{(1+r)^t} \right)}{\sum_{t=1}^n \left(\frac{C_t}{(1+r)^t} \right)}$$

wherein B_t and C_t are benefit streams and cost streams of the individual's decision over time period t relating to a given level of education, and r is the rate of discount. B_t is the excess of earnings of productivity as a result of a given level of education as compared to a lower level of education. C_t is the cost of acquiring a given level of education.

In order to calculate the internal rate of return, it is necessary to find out a rate of discount which will equate the present value of benefits and costs. Thus we get

$$\sum_{t=1}^n \left(\frac{B_t}{(1+r)^t} \right) - \sum_{t=1}^n \left(\frac{C_t}{(1+r)^t} \right) = 0$$

where r is unknown.

If we are concerned with measuring the social rates of return, social costs and social benefits are taken into account. In social costs are included, institutional costs including implicit interest and depreciation charges, non-tuition costs incurred by the students and the earnings foregone. If the idea is to measure private costs and private benefits, the elements of costs to be taken into account are fees, non-tuition costs and earnings foregone, while in case of benefits, earnings net of income-tax are taken. Rates of return based on such calculations yield crude rates and various refinements can be introduced.¹

Here we are interested in calculating the private rates of return to higher education in Tamil Nadu on the assumption that, by and large, the benefits of higher education are almost wholly reflected in the increased private earnings. The method of analysis is the internal rate of return approach.

To measure the private rates of return to higher education, we should know:

66

-
1. Padmanabhan, C.B. - Economics of Educational Planning in India, Arya Book Depot, 1971.

- a) the age - qualification specific earnings' data of Tamil Nadu with respect to Matriculates and Graduates,
- b) the private cost of education, and
- b) the earnings foregone.

From the NSS Round of 1970-71, we have the age-qualification specific earnings' data for wages and salaries for Matriculates and Graduates of Tamil Nadu. Using this data, we can estimate the age structure of earners in each educational level and the age-earning profile for each educational level. It may be noted that the data pertain to 1970-71 which is about a decade back. However, we are helpless in this regard as no other data of a similar coverage for Tamil Nadu are available.

The duration of study to complete graduation and the private cost of general and professional education have already been worked out in earlier chapters. The private cost of education of the sample survey refers to the year 1978-79. The available age-qualification earnings' data refer to 1970-71. Therefore, the private cost of education has to be deflated to the base year 1970-71, by using the wholesale price index number.

The details relating to the duration of study to complete graduation in general or professional education and the direct private cost of education are as follows:

General Education (Arts, Science and Commerce):

Four years after Matriculation - Graduation on completion of 20 years. The direct private cost per student is Rs.1720/- per year at 1978-79 prices (Fees Rs.460/- + Non-fees Rs.1260/- per year).

Professional Education (Engineering and Medicine):

Six years after Matriculation. Graduation on completion of 22 years. The direct private cost per student is Rs.2831/- per year at 1978-79 prices (Fees Rs.509/- + Non-fees Rs.2322/- per year).

All Graduates:

Six years after Matriculation. Graduation on completion of 22 years. Arts, Science and Commerce courses extend over 4 years, while Engineering and Medicine extend over 6 years. Therefore, 6 years have been taken as a representative figure. Direct cost per student is Rs.1961/- per year at 1978-79 prices (Fees Rs.471/- + Non-fees Rs.1490/- per year).

Table VIII - (1) shows the direct private cost per student per year at 1978-79 prices:

Private Rates of Return

Making use of the NSS Round age-qualification specific earnings' data for wages and salaries for Matriculates and Graduates of Tamil Nadu for the year 1970-71 and the private cost of education for all Graduates for 1978-79 deflated by the wholesale price index to 1970-71 prices, we next proceed to calculate

TABLE VIII - (1)
 SAMPLE POPULATION
 DIRECT COST PER STUDENT¹
 AT 1978 - 79 PRICES

Course	Number and per- centage of stud- ents	Annual Expen- diture on Fees* Rs.00	Annual Expen- diture on Non- Fees Rs.	Total Annual Expen- diture Rs.
1	2	3	4	5
Arts, Science and Commerce	998 (78)	460	1260	1720
Engineering and Medi- cine	276 (22)	509	2322	2831
All Gradu- ates	1274 (100)	471	1490	1961

the private internal rate of return. The internal rate of return is a rate of discount that makes the series of absolute earnings differentials between two educational levels sum to zero. Therefore, we need to know,

- the duration of schooling to complete graduate studies,
- the respective cost of education, and
- the earnings foregone.

Items (a) and (b) have already been calculated.

1 Prepared from Table V - (13)

* Fees include College fees + University Exam fees.

Note: Numbers in brackets denote percentages.

Earnings foregone, however, constitute the most important item. We assume that the earnings of Matriculates are the earnings foregone by college students and Graduates.

For each educational level the earnings would differ with each age group. The data available show for each five-year age-group, the age qualification earnings.

Table VIII - (2) shows the earners by five-year age-groups as available from the NSS Round. Keeping this age distribution in the background and making suitable adjustments for each educational level, the single-year-age distribution of the earners by the relevant educational level is obtained as shown in Table VIII - (3).

Having obtained the single-year age earning profile for Matriculates and Graduates and the cost of education data for all Graduates, we are now in a position to find out the stream of net earnings for each educational level. These net earnings consist of earnings relating to the particular educational level less the cost of obtaining that particular level of education. The net earnings stream for all Graduates is given in Table VIII - (4)*

The next step is to calculate by process of trial and error a rate of discount which would make this series sum to zero. Table VIII - (5) illustrates

*As stated earlier, since the earnings data refer to the year 1970-71 and the cost of education to the year 1978-79, the latter has been deflated to 1970-71 prices (the whole-sale price index of 1978-79 with base 1970-71 = 181.7 per cent).

this with reference to all Graduates. The rate of discount is fairly low, being 7.7% only.

One important reason for the low rate of discount is that the NSS earnings data for Matriculates and Graduates refer only to wage-earners and salaried employees. The data do not include self-employed graduates; earners, such as, doctors, lawyers, businessmen, engineers, agriculturists and the like. Both from the point of view of income earned, as well as the number of people who earn income by self-employment, self-employed graduates form a crucial sector of income earners. The omission of this sector from the age-qualification specific earnings data is bound to affect the private rate of returns. Therefore, our estimate of the private rates of return to higher education in Tamil Nadu is an underestimate. Our estimates are crude and various refinements such as, corrections for wastage and stagnation, survival rates, participation rates, ability factor and unemployment are possible, and would further reduce the returns. It is interesting to see that higher education appears to be not a very attractive proposition. This would possibly explain the fact noted earlier, that of, the slackening in the rates of growth of enrolments at higher education.

TABLE VIII - (2)

TAMIL NADU

AGE-EARNING PROFILE BY FIVE-YEAR AGE-GROUPS

1970 - 71

Five-Year Age-Groups	Annual Earnings of Matriculates Rupees	Annual Earnings of Graduates Rupees
1	2	3
15 - 17	3,120	-
20 - 24	2,098	3,322
25 - 29	2,499	3,221
30 - 34	3,621	4,089
35 - 39	2,632	5,113
40 - 44	3,842	6,157
45 - 49	2,995	8,700
50 - 54	2,916	8,400
55 - 59	2,853	11,100
60 and above	1,445	6,000

Source: Data collected from the Directorate of Statistics, Madras.

TABLE VIII - (3)

TAMIL NADU

AGE-EARNING PROFILE BY SINGLE-YEAR-AGE-DISTRIBUTION

1970 - 71

Single- year-age- distribution	Annual Earnings of Matriculates Rupees	Annual Earnings of Graduates Rupees	Difference in Earnings columns (2-3) Rupees
1	2	3	4
18	2916	-	-
19	2712	-	-
20	2508	3322	814
21	2304	3302	990
22	2098	3282	1184
23	2178	3262	1084
24	2258	3242	984
25	2338	3221	883
26	2418	3394	976
27	2499	3567	1068
28	2723	3740	1017

(CONTD...)

TABLE VIII - (3) (CONTD....)

1	2	3	4
29	2947	3913	966
30	3171	4087	916
31	3395	4292	897
32	3621	4497	876
33	3423	4702	1279
34	3225	4907	1682
35	3027	5113	2086
36	2829	5322	2493
37	2632	5531	2899
38	2874	5740	2866
39	3116	5949	2833
40	3358	6157	2799
41	3600	6666	3066
42	3842	7175	3333
43	3673	7684	4011
44	3504	8193	4689
45	3335	8700	5365
46	3166	8640	5474
47	2995	8580	5585

(CONTD....)

TABLE VIII - (3) (CONTD....)

1	2	3	4
48	2979	8520	5541
49	2963	8460	5497
50	2947	8400	5453
51	2931	8940	6009
52	2916	9480	6564
53	2903	10,020	7117
54	2890	10,560	7670
55	2877	11,100	8223
56	2864	10,080	7216
57	2853	9,060	6207
58	2571	8,040	5469
59	2289	7,020	4731
60	2007	6,000	3993

Prepared from Table VIII - (2)

TABLE VIII - (4)

TAMIL NADU

THE NET EARNINGS STREAM FOR ALL GRADUATES

1970 - 71

(In Rupees)

Single year Age Distribution	Private cost of Education at 1978-79 prices	Private cost of Education Deflated to 1970-71 prices by (181.7%)	Annual Earnings of Matriculates at 1970-71 prices	Annual Earnings of Graduates at 1970-71 prices	Excess of (+) or (-) Earnings of Graduates over Matriculates at 1970-71 prices columns (5-4-3)
1	2	3	4	5	6
18	1961	1079	2916	0	-3995
19	1961	1079	2712	0	-3791
20	1961	1079	2508	0	-3587
21	1961	1079	2304	0	-3383
22	1961	1079	2098	0	-3177
23	-	-	2178	3262	1084
24	-	-	2258	3242	984
25	-	-	2338	3221	883
26	-	-	2418	3394	976
27	-	-	2499	3567	1068

(CONTD...)

TABLE VIII - (4) (CONTD....)

1	2	3	4	5	6
28	-	-	2723	3740	1017
29	-	-	2947	3913	966
30	-	-	3171	4087	916
31	-	-	3395	4292	897
32	-	-	3621	4497	876
33	-	-	3423	4702	1279
34	-	-	3225	4907	1682
35	-	-	3027	5113	2086
36	-	-	2829	5322	2493
37	-	-	2632	5531	2899
38	-	-	2874	5740	2866
39	-	-	3116	5949	2833
40	-	-	3358	6157	2799
41	-	-	3600	6666	3066
42	-	-	3842	7175	3333
43	-	-	3673	7684	4011
44	-	-	3504	8193	4689
45	-	-	3335	8700	5365

(CONTD....)

TABLE VIII - (4) (CONTD....)

1	2	3	4	5	6
46	-	-	3166	8640	5474
47	-	-	2995	8580	5585
48	-	-	2979	8520	5541
49	-	-	2963	8460	5497
50	-	-	2947	8400	5453
51	-	-	2931	8940	6009
52	-	-	2916	9480	6564
53	-	-	2903	10,020	7117
54	-	-	2890	10,560	7670
55	-	-	2877	11,100	8223
56	-	-	2864	10,080	7216
57	-	-	2853	9,060	6207
58	-	-	2571	8,040	5469
59	-	-	2289	7,020	4731
60	-	-	2007	6,000	3993

TABLE VIII - (5)
THE NET EARNINGS STREAM FOR ALL GRADUATES
DISCOUNTED AT 7.7% INTEREST
1970 - 71

Single year Age Distribution	Actual Earnings' Difference	Deflated Cumulative Earnings of Previous at 7.7% Interest	Carried Forward Columns (2+3)
1	2	3	4
60	3993	0	3993
59	4731	3708	8439
58	5469	7836	13305
57	6207	12354	18561
56	7216	17234	24450
55	8223	22702	30925
54	7670	28714	36384
53	7117	33783	40900
52	6564	37976	44540
51	6009	41356	47365

(CONTD...)

TABLE VIII - (5) (CONTD....)

1	2	3	4
50	5453	43978	49431
49	5497	45897	51394
48	5541	47719	35260
47	5585	49452	55037
46	5474	51102	56576
45	5365	52531	57896
44	4689	53756	58445
43	4011	54267	58278
42	3333	54111	57444
41	3066	53337	56403
40	2799	52370	55169
39	2833	51225	54058
38	2866	50193	53059
37	2899	49265	52164
36	2493	48435	50928
35	2086	47287	49373
34	1682	45843	47525

(CONTD....)

TABLE VIII - (5) (CONT'D...)

1	2	3	4
33	4279	44127	45406
32	876	42159	43035
31	897	39958	40855
30	916	37934	38850
29	966	36072	37038
28	1017	34390	35407
27	1068	32876	33944
26	976	31517	32493
25	883	30170	31053
24	984	28833	29817
23	1084	27685	28769
22	-3177	26712	23535
21	-3383	21852	18469
20	-3587	17149	13562
19	-3791	12592	8801
18	-3995	8172	4177